

Business Continuity Solutions

BUSINESS CONTINUITY

SonicWALL CDP Series

SonicWALL Bare Metal Recovery **User's Guide**



Copyright © SonicWALL, Inc., 2000-2008. All rights reserved.

“SonicWALL” is a registered trademark of SonicWALL, Inc.

Linux is a registered trademark of Linus Torvalds.

Windows and MS-DOS are registered trademarks of Microsoft Corporation.

All other trademarks and copyrights referred to are the property of their respective owners.

Distribution of substantively modified versions of this document is prohibited without the explicit permission of the copyright holder.

Distribution of this work or derivative work in any standard (paper) book form for commercial purposes is prohibited unless prior permission is obtained from the copyright holder.

DOCUMENTATION IS PROVIDED «AS IS» AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.

BY ACCEPTING, YOU (ORIGINAL PURCHASER) INDICATE YOUR ACCEPTANCE OF THESE TERMS. IF YOU DO NOT WISH TO ACCEPT THE PRODUCT UNDER THESE TERMS YOU MAY CHOOSE NOT TO ACCEPT BY SELECTING "**I decline...**" AND NOT INSTALLING THE SOFTWARE.

The name Acronis, the software, the product name Acronis True Image, and the Acronis logo are registered trademarks of Acronis Inc. BVI. **Acronis True Image** (the Software) is copyright 2000-2008 by **Acronis**. All rights are reserved.

The ORIGINAL PURCHASER is granted a LICENSE to use the software only, subject to the following restrictions and limitations.

1. The license is to the original purchaser only, and is not transferable without prior written Permission from Acronis.
2. The Original Purchaser may use the Software on a single computer owned or leased by the Original Purchaser. You may not use the Software on more than a single machine even if you own or lease all of them without the written consent of SonicWALL.
3. The Original Purchaser may not engage in, nor permit third parties to engage in, any of the following:
 - A. Providing or permitting use of or disclosing the Software to third parties.
 - B. Providing use of the Software in a computer service business, network, timesharing or multiple user arrangement to users who are not individually licensed by Acronis.
 - C. Making alterations or copies of any kind in the Software (except as specifically permitted above).
 - D. Attempting to un-assemble, de-compile or reverse engineer the Software in any way.
 - E. Granting sublicenses, leases, or other rights in the Software to others.
 - F. Making copies, or verbal or media translations, of the user's guide.
 - G. Making telecommunication data transmission of the software.

SonicWALL and/or Acronis has the right to terminate this license if there is a violation of its terms or default by the Original Purchaser. Upon termination for any reason, all copies of the Software must be immediately returned to SonicWALL, and the Original Purchaser shall be liable to Acronis for any and all damages suffered as a result of the violation or default.

ENTIRE RISK

THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE SOFTWARE IS WITH YOU THE PURCHASER. NEITHER SONICWALL NOR ACRONIS WARRANTS THAT THE SOFTWARE OR ITS FUNCTIONS WILL MEET YOUR REQUIREMENTS OR THAT THE OPERATION OF THE SOFTWARE WILL BE UNINTERRUPTED OR ERROR FREE OR THAT ANY DEFECTS WILL BE CORRECTED.

NO LIABILITY FOR CONSEQUENTIAL DAMAGES - IN NO EVENT SHALL SONICWALL, ACRONIS OR ITS VENDORS BE LIABLE FOR ANY DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR THE LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR ANY OTHER PECUNIARY LOSS) ARISING OUT OF THE USE OR INABILITY TO USE THE SOFTWARE, EVEN IF SONICWALL AND/OR ACRONIS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Table of Contents

Chapter 1. Introduction	8
1.1 SonicWALL® Bare Metal Recovery – a complete solution for corporate users	8
1.2 SonicWALL Bare Metal Recovery components.....	9
1.3 Supported file systems and storage media	10
1.3.1 <i>Supported file systems</i>	10
1.3.2 <i>Supported storage media</i>	10
Chapter 2. SonicWALL Bare Metal Recovery Server Edition installation and startup.....	12
2.1 System requirements	12
2.1.1 <i>Minimum hardware requirements</i>	12
2.1.2 <i>Supported operating systems and processors</i>	12
2.2 Installing SonicWALL Bare Metal Recovery components	13
2.2.1 <i>Installation of SonicWALL Bare Metal Recovery Server Edition</i>	13
2.2.2 <i>SonicWALL Bare Metal Recovery Universal Enterprise Server installation</i>	13
2.3 Running SonicWALL Bare Metal Recovery	14
2.4 Removing SonicWALL Bare Metal Recovery components	14
Chapter 3. General information and proprietary SonicWALL technologies	15
3.1 The disk/partition image	15
3.2 Full and incremental backups.....	15
3.3 SonicWALL Universal Restore	16
3.3.1 <i>SonicWALL Universal Restore purpose</i>	16
3.3.2 <i>SonicWALL Universal Restore general principles</i>	16
3.3.3 <i>SonicWALL Universal Restore and Microsoft Sysprep</i>	17
3.3.4 <i>Limitations in using SonicWALL Universal Restore</i>	17
3.4 Viewing disk and partition information.....	17
Chapter 4. Using SonicWALL Bare Metal Recovery	19
4.1 Main program window	19
4.2 Available operations.....	20
Chapter 5. Creating backup archives	23
5.1 Backing up disks and partitions (image backup)	23
5.2 Setting backup options.....	26
5.2.1 <i>Archive protection</i>	26
5.2.2 <i>Pre/post commands</i>	27
5.2.3 <i>Database support</i>	28
5.2.4 <i>Compression level</i>	30
5.2.5 <i>Backup performance</i>	31
5.2.6 <i>Archive splitting</i>	32
5.2.7 <i>Media components</i>	33
5.2.8 <i>Error handling</i>	33
5.2.9 <i>Additional settings</i>	34
Chapter 6. Restoring the backup data	36
6.1 Considerations before recovery.....	36
6.1.1 <i>Restore under Windows or boot from CD?</i>	36
6.1.2 <i>Network settings in rescue mode</i>	36
6.1.3 <i>Recovering dynamic volumes</i>	36
6.2 Restoring files and folders from images	37
6.3 Restoring disks/partitions from images	40
6.3.1 <i>Starting the Restore Data Wizard</i>	40
6.3.2 <i>Archive selection</i>	40
6.3.3 <i>Restoration type selection</i>	41

6.3.4	Selecting a disk/partition to restore	42
6.3.5	Selecting a target disk/partition.....	42
6.3.6	Changing the restored partition type.....	43
6.3.7	Changing the restored partition size and location.....	44
6.3.8	Assigning a letter to the restored partition.....	44
6.3.9	Restoring several disks or partitions at once.....	45
6.3.10	Using SonicWALL Universal Restore	45
6.3.11	Setting restore options.....	46
6.3.12	Restoration summary and executing restoration.....	46
6.4	Setting restore options.....	47
6.4.1	Files overwriting mode.....	47
6.4.2	Pre/post commands	48
6.4.3	Restoration priority.....	48
6.4.4	File-level security settings	49
6.4.5	Additional settings.....	50
6.4.6	Error handling.....	50
6.5	Creating dynamic disks and volumes	51
6.5.1	Creating dynamic volumes	51
Chapter 7.	Scheduling tasks.....	54
7.1	Creating scheduled tasks.....	54
7.1.1	Setting up daily execution.....	56
7.1.2	Setting up weekly execution.....	56
7.1.3	Setting up monthly execution.....	57
7.1.4	Setting up one-time execution.....	58
7.2	Managing scheduled tasks.....	58
Chapter 8.	Creating bootable media	59
Chapter 9.	Operations with archives.....	61
9.1	Validating backup archives	61
9.2	Exploring archives and mounting images	61
9.2.1	Exploring an archive.....	62
9.2.2	Mounting an image	63
9.2.3	Unmounting an image	64
9.3	Converting disk images to virtual disks	64
9.4	Consolidating backups	65
Chapter 10.	Notifications and event tracing	68
10.1	Email notification	68
10.2	WinPopup notification	69
10.3	Viewing logs.....	69
10.4	Event tracing.....	70
10.4.1	Windows event log.....	70
10.4.2	SNMP notifications.....	71
Chapter 11.	Transferring the system to a new disk.....	72
11.1	General information	72
11.2	Security	72
11.3	Executing transfers	73
11.3.1	Selecting Clone mode	73
11.3.2	Selecting source disk	73
11.3.3	Selecting destination disk.....	74
11.3.4	Partitioned destination disk	75
11.3.5	Old and new disk partition layout.....	75
11.3.6	Old disk data	75
11.3.7	Destroying the old disk data.....	76
11.3.8	Selecting partition transfer method	77
11.3.9	Partitioning the old disk	78

11.3.10 Old and new disk partition layouts	78
11.3.11 Cloning summary.....	79
11.4 Cloning with manual partitioning.....	79
11.4.1 Old and new disk partition layouts	79
Chapter 12. Adding a new hard disk	81
12.1 Selecting a hard disk.....	81
12.2 Creating new partitions	81
12.3 Disk add summary	82
Chapter 13. Command-line mode	83
13.1 Working in the command-line mode	83
13.1.1 Supported commands.....	83
13.1.2 Common options (options common for most baremetalrecoverycmd commands)	84
13.1.3 Specific options (options specific for individual baremetalrecoverycmd commands)	85
13.1.4 baremetalrecoverycmd.exe usage examples	87
13.1.5 Command-line mode usage under DOS	88

Chapter 1. Introduction

1.1 SonicWALL® Bare Metal Recovery – a complete solution for corporate users

SonicWALL Bare Metal Recovery is a comprehensive backup and recovery solution for heterogeneous computer infrastructure that may include any combination of physical and virtual, networked and standalone, Windows- and Linux-based servers.

SonicWALL Bare Metal Recovery creates a transportable image, independent of the hardware platform that can be restored directly to and from any virtual or physical environment.

Minimizes downtime

SonicWALL Bare Metal Recovery enables you to restore systems in minutes, not hours or days. An entire system can be restored from an image that includes everything the system needs to run: the operating system, applications, databases, and configurations. It is not necessary to reinstall software or reconfigure your system or network settings. The complete system restoration can be performed to an existing system, to a new system with different hardware, or to virtual machines.

Eases Administration

Wizards guide users through backup and recovery tasks, ensuring the product can be implemented with minimal user training.

Automates Backup

With the scheduling capability in SonicWALL Bare Metal Recovery, you simply create backup tasks, tailored by group, or certain times or events.

To ensure that backups have occurred, or if user intervention is required, you can request notifications via email or Windows Pop-up. You can view SonicWALL events in the Windows Application Events Log or SonicWALL own log files. Log messages can be automatically sent out to SNMP clients.

The product also supports the creation of custom commands before and after backups. For example, users can automatically run anti-virus products before an image is created and verify the validity of backups after the image has been created. And because these tasks can be scheduled, you need not recreate the script to run the pre- and post-event tasks each time; you can set the scheduled events once and they will run each time automatically.

Ensures 24 X 7 Uptime

With SonicWALL' patented drive snapshot technology, systems can be imaged while they are in use, ensuring 24-by-7 system availability. This technology enables the product to backup and image critical operating system files, the master boot record and any partition-based boot records without requiring a reboot.

A feature that allows you to suspend database activity for several seconds is provided so that you can create a valid image of mission-critical applications such as Microsoft Exchange Server, Microsoft SQL Server and Oracle. This database suspension process supports Microsoft's Volume Shadow Copy Service (VSS). If your database or operating system does not support VSS, SonicWALL Bare Metal Recovery will execute your custom commands to execute database suspension.

Supports Leading Edge Technology

Businesses today are moving to leverage the latest technologies, including dual-core, 64-bit processors and 64-bit operating systems. With SonicWALL Bare Metal Recovery, you can protect these new machines, as well as legacy servers, running a single application with a common interface.

Leverages Existing Technology Investments

The product can leverage your current storage infrastructure by supporting a variety of storage media, so you can avoid costly hardware purchases to implement the solution. The product supports key storage technologies such as: Direct Attached Storage (DAS), Network Attached Storage (NAS), Storage Area Networks (SAN), Redundant Arrays of Independent Disks (RAID), USB and IEEE-1394 (FireWire) compliant storage devices, CDs, DVDs, removable drives (Floppy, Zip, etc.) and shared storage. Moreover, the product ensures that you maximize the space on these resources with four levels of compression.

Disk cloning and new disk deployment

SonicWALL Bare Metal Recovery can be used to clone an image onto multiple servers. For example, let's say a company purchased several servers and needs similar environments on each of them. Traditionally, the IT manager would install the operating system and programs on every server. With SonicWALL Bare Metal Recovery, the IT manager would configure a single server, then create a disk image of the system. That image can then be duplicated onto multiple servers.

If you need to upgrade the server hard disk drive, SonicWALL Bare Metal Recovery simplifies the task to few mouse clicks creating the exact copy of your old disk to a new one and adjusting partitions size to fit a new hard disk.

Volumes conversion

SonicWALL Bare Metal Recovery can back up and recover dynamic volumes.

Dynamic volume as is can be recovered over the same volume or unallocated space of a dynamic group. SonicWALL Bare Metal Recovery has necessary tools for any-to-any disks conversion in terms of basic disks and dynamic volumes of any type (simple, spanned, striped, mirrored or RAID 5). The tools are available in bootable program version as well. Having booted the SonicWALL environment, you can easily prepare the desired dynamic group on bare metal or a computer with non-Windows operating system.

1.2 SonicWALL Bare Metal Recovery components

SonicWALL Bare Metal Recovery Server Edition is a locally controlled server management tool. The local version supports, besides backup and recovery operations, exploring archives, mounting images as virtual drives, cloning hard disks data and formatting partitions on new hard disks and command-line mode.

SonicWALL Bare Metal Recovery Universal Enterprise Server is a wide version of SonicWALL Bare Metal Recovery. It can be installed in two ways: either by entering its' license key during the installation or by using separately sold Upgrade Install Utility setup file to SonicWALL Bare Metal Recovery Server Edition.

The following functions exist only in the enterprise edition:

1. pre-installed Acronis Universal Restore
2. incremental backups

-
3. image mounting in read/write mode
 4. dynamic disks support
 5. image consolidation
 6. backup scheduling
 7. backup multiple increments throughout a day
 8. schedule periodic backup validation
 9. Microsoft Volume Shadow copy Service (VSS) support



Further in the text all mentions of these functions are related to the SonicWALL Bare Metal Recovery Universal Enterprise Server.

SonicWALL Bootable Rescue Media Builder - creates bootable media, its ISO image or the RIS package thus enabling data recovery over bare metal, non-Windows or corrupted operating systems.

1.3 Supported file systems and storage media

1.3.1 Supported file systems

- FAT16/32
- NTFS
- Ext2/Ext3
- ReiserFS
- Reiser4 (w/o resize)
- XFS (w/o resize)
- JFS
- DFS

If a file system is not supported or is corrupted, SonicWALL Bare Metal Recovery can copy data using a sector-by-sector approach.

1.3.2 Supported storage media

- Hard disk drives (IDE, SATA, SCSI)
- Networked storage devices such as Storage Area Networks (SANs) and Network Attached Storage (NAS)
- IDE and SCSI RAID controllers of any level
- FTP-servers*
- CD-R/RW, DVD-R/RW, DVD+R (including double-layer DVD+R), DVD+RW, DVD-RAM**
- USB 1.0 / 2.0, FireWire (IEEE-1394) and PC card storage devices
- ZIP®, Jaz® and other removable media

* - an FTP-server must allow passive mode for file transfers. Data recovery directly from FTP-server requires the archive to consist of files no more than 2GB in size. It is recommended that you change the source computer firewall settings to open ports 20

and 21 for both TCP and UDP protocols and disable the **Routing and Remote Access** Windows service.

** - Burned rewritable discs cannot be read in Linux without kernel patch.

Chapter 2. SonicWALL Bare Metal Recovery Server Edition installation and startup

2.1 System requirements

2.1.1 Minimum hardware requirements

SonicWALL Bare Metal Recovery Server Edition requires the following hardware:

- Pentium processor or higher
- 256MB RAM
- FDD or CD-RW drive for bootable media creation
- Mouse (recommended).

2.1.2 Supported operating systems and processors

SonicWALL Bare Metal Recovery Server Edition

- Windows Professional 2000 SP4/ Professional XP SP2
- 32-bit and 64-bit processors
- Windows Home Server
- Windows 2000 Server/Advanced Server
- Windows 2003 Server/Advanced Server
- Windows Small Business Server 2003
- Windows Server 2008 (Standard)

SonicWALL Bare Metal Recovery Universal Enterprise Server

- Windows Professional 2000 SP4/ Professional XP SP2
- 32-bit and 64-bit processors
- Windows Home Server
- Windows 2000 Server/Advanced Server
- Windows 2003 Server/Advanced Server
- Windows Small Business Server 2003
- Windows Server 2008 (Standard)

SonicWALL Bare Metal Recovery bootable version enables disk-level backup and recovery on a computer running any PC-based operating system.

2.2 Installing SonicWALL Bare Metal Recovery components

2.2.1 Installation of SonicWALL Bare Metal Recovery Server Edition



SonicWALL Bare Metal Recovery Server Edition Install Window

For SonicWALL Bare Metal Recovery Server Edition **Typical**, **Custom** and **Complete** installation is available. Having pressed **Custom**, you can choose to install, besides the main component, **Rescue Media Builder** and **Bart PE plug-in** for SonicWALL Bare Metal Recovery Server Edition.

With **Rescue Media Builder** you can create bootable rescue disks or RIS packages (see details in [Chapter 8. Creating bootable media](#)). Installing the **Bootable Rescue Media Builder** will allow you to create bootable media, its ISO image or a bootable RIS package at any time from the main program window or running **Bootable Rescue Media Builder** on its own.

The widely used **Bart PE** utility provides a Windows-like operating environment invoked via removable bootable media. Applications are installed into Bart PE in the form of plug-ins. Choosing Bart PE plug-in installation (disabled by default) provides the ability to include SonicWALL Bare Metal Recovery Server Edition into a Bart PE plug-in tab. The plug-in files will be placed into the component installation folder along with other program files.



When installed, SonicWALL Bare Metal Recovery Server Edition creates a new device in the Device Manager list (**Control Panel -> System -> Hardware -> Device Manager -> SonicWALL Devices -> SonicWALL BareMetalRecovery Backup Archive Explorer**). Do not disable or uninstall this device, as it is necessary for connecting image backups as virtual disks (see [9.2.2 Mounting an image](#)).

2.2.2 SonicWALL Bare Metal Recovery Universal Enterprise Server installation

SonicWALL Bare Metal Recovery Universal Enterprise Server is a wide version of SonicWALL Bare Metal Recovery. It can be installed in two ways: either by entering its' license key during the installation (see [2.2.1 Installation of SonicWALL Bare Metal](#)

[*Recovery Server Edition*](#)) or by using separately sold Upgrade Install Utility setup file to SonicWALL Bare Metal Recovery Server Edition.

After installation, SonicWALL Bare Metal Recovery Universal Enterprise Server automatically plugs in one or more of above program components. If it was installed as an Upgrade Install Utility, then SonicWALL Bare Metal Recovery Server Edition name, displayed in its main window, changes to **SonicWALL Bare Metal Recovery Universal Enterprise Server**.

2.3 Running SonicWALL Bare Metal Recovery

You can run SonicWALL Bare Metal Recovery in Windows by selecting **Start -> Programs -> SonicWALL -> SonicWALL Bare Metal Recovery -> SonicWALL Bare Metal Recovery** or clicking the appropriate shortcut on the desktop.

If your disk data is totally corrupted and you cannot boot, load the standalone SonicWALL Bare Metal Recovery version from the bootable media (created by you using Rescue Media Builder) or RIS-server. Then you will be able to restore the disk from a previously created image.

2.4 Removing SonicWALL Bare Metal Recovery components

You can remove any SonicWALL Bare Metal Recovery by selecting **Control panel -> Add or remove programs -> <SonicWALL Bare Metal Recovery> -> Remove**. Then follow instructions on the screen. You may have to reboot your computer afterwards to complete the task. If you want to remove SonicWALL Bare Metal Recovery component, run the installer, click on "Modify" button and unselect components in custom setup window.

Chapter 3. General information and proprietary SonicWALL technologies

3.1 The disk/partition image

A disk (partition) image is a file that contains a copy of all information stored on a disk. Image stores all the server data including operating system, databases, all programs, data, and settings.

By backing up your information regularly you will completely protect yourself from data losses in case of system failures and even server malfunctions.

To restore your system after a failure it would be enough to restore information from a previously created image.

By default SonicWALL Bare Metal Recovery image files have **“.tib”** extension and can contain images of several partitions or disks.

An image file, containing a large partition image or several disks images, might have considerable size. In this case it can be split into several files that together make an original image. A single image can also be split for burning to removable media.



SonicWALL Bare Metal Recovery stores only those hard disk parts that contain data (for supported partition types). This reduces image size and speeds up image creation and restoration.



A partition image includes all files and folders independently of their attributes (including hidden and system files), boot record, FAT, and Root.



A disk image includes images of all disk partitions as well as the zero track with Master Boot Record (MBR).

All SonicWALL Bare Metal Recovery archives files have a **“.tib”** extension by default.



SonicWALL Bare Metal Recovery allows you to restore not only the full image but also only necessary files and folders from the image.

3.2 Full and incremental backups

SonicWALL Bare Metal Recovery can create full and incremental (in enterprise version only) backups.

A **full backup** contains all data at the moment of backup creation. It forms a base for further incremental backup or is used as a standalone archive. A full backup has the shortest restore time as compared to incremental one.

An **incremental backup** only contains data changed since the last full or incremental backup creation. Therefore, it is smaller and takes less time to create. However, since it does not contain all data needed to restore an image, *all* the previous incremental backups *and* the initial full backup are required for restoration.

A standalone, full backup could be an optimal solution if you often roll back the system to the initial state (for example, systems in a gaming club or Internet café where you need

to undo changes made by the guests). In this case, you need not re-create the initial full image, so the backup time is not crucial and the restore time will be minimal.

An incremental backup is most useful when you need frequent backups and possibility to roll back to any one of multiple stored states. For example, let's say you create a full backup once a month. If you then create an incremental backup each day of a month, you will get the same result as if you created full backups every day. However, the cost in time and disk space (or removable media usage) will be as little as one tenth as much.

It is important to note that the above arguments are just examples for your information. Feel free to make up your own backup policy in accordance with your specific tasks and conditions. SonicWALL Bare Metal Recovery is flexible enough to meet any real-life demands.



An incremental backup created after a disk is defragmented might be considerably larger than usual. This is because the defragmentation program changes file locations on disk and the backups reflect these changes. Therefore, it is recommended that you re-create a full backup after disk defragmentation.

3.3 SonicWALL Universal Restore

3.3.1 SonicWALL Universal Restore purpose

A system disk image can be deployed easily on the hardware where it was created or to identical hardware. However, if you change a motherboard or use another processor version — a likely possibility in case of hardware failure — the restored system could be unbootable. An attempt to transfer the system to a new, much more powerful computer will usually produce the same unbootable result because the new hardware is incompatible with the most critical drivers included in the image.

Using Microsoft System Preparation Tool (Sysprep) does not solve this problem, because Sysprep permits replacing drivers only for Plug-and-Play devices (sound cards, network adapters, video cards etc.). As for system Hardware Abstraction Layer (HAL) and mass storage device drivers, they must be identical on the source and the target computers (see Microsoft Knowledge Base, articles 302577 and 216915).

SonicWALL Universal Restore technology provides an efficient solution for hardware-independent system restoration by replacing the crucial Hardware Abstraction Layer (HAL) and mass storage device drivers.

SonicWALL Universal Restore is applicable for:

1. Instant recovery of a failed system on different hardware
2. Hardware-independent cloning and deployment of operating systems
3. Real-to-virtual and virtual-to-real computer migration for system recovery, test and other purposes.

3.3.2 SonicWALL Universal Restore general principles

1. Automatic HAL and mass storage drivers selection

SonicWALL Universal Restore searches the Windows default driver storage folders (in the image being restored) for HAL and mass storage device drivers and installs drivers that better fit the target hardware. You can specify a custom driver repository (a folder or folders on a network drive or CD) which will also be used for drivers search.



The Windows default driver storage folder is determined in the registry key HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\Current version\DevicePath. This storage folder is usually WINDOWS\inf.

2. Manual selection of mass storage device driver

If the target hardware has a specific mass storage controller (such as a SCSI, RAID, or Fibre Channel adapter) for the hard disk, you can install the appropriate driver manually, bypassing the automatic driver search-and-install procedure.

3. Installing drivers for plug and play devices

SonicWALL Universal Restore relies on built-in plug and play discovery and configuration process to handle hardware differences in devices that are not critical for the system start, such as video, audio and USB. Windows takes control over this process during the logon phase, and if some of the new hardware is not detected, you will have a chance to install drivers for it later manually.

3.3.3 SonicWALL Universal Restore and Microsoft Sysprep

SonicWALL Universal Restore is *not* a system preparation tool. You can apply it to any system image created by SonicWALL products, including images prepared with Microsoft System Preparation Tool (Sysprep). The following is an example of using both tools on the same system.

SonicWALL Universal Restore does not strip security identifier (SID) and user profile settings in order to run the system immediately after recovery without re-joining the domain or re-mapping network user profiles. If you are going to change the above settings on a recovered system, you can prepare the system with Sysprep, image it and restore, if need be, using SonicWALL Universal Restore.

3.3.4 Limitations in using SonicWALL Universal Restore

1. The system recovered by SonicWALL Universal Restore might not start if the partition structure in the image or the target disk partitioning does not coincide with that of the source disk. As a result, the loader, restored from the image, will point to the wrong partition and the system will not boot or will malfunction.

Such might be the case if you:

- image only selected partitions but not the entire source disk



Keep in mind, that the source disk may have a hidden maintenance partition created by the computer vendor. Therefore, if you check each partition for backup instead of checking the disk, this hidden partition will not be included into the image.

- restore not the entire source disk, but only the selected partitions. In some cases, especially if your system resides on a partition other than the first, this can confuse the loader and prevent the restored system from startup.

To avoid the problem, we recommend that you image and restore the entire system disk.

3.4 Viewing disk and partition information

You can change the way data is represented in all schemes you see in various wizards.

To the right are three icons: **Arrange Icons by**, **Choose Columns...** and **i (Display the properties of the selected item)**, the last duplicated in the context menu invoked by right-clicking objects.

To sort messages by a particular column, click the header (another click will switch the messages to the opposite order) or **Arrange Icons by** button and select the column.

To select columns to view, right-click the headers line or left-click the **Choose Columns...** button. Then flag the columns you want to display.

If you click the **i (Display the properties of the selected item)** button, you will see the selected partition or disk properties window.

This window contains two panels. The left panel contains the properties tree and the right describes the selected property in detail. The disk information includes its physical parameters (connection type, device type, size, etc.); partition information includes both physical (sectors, location, etc.), and logical (file system, free space, assigned letter, etc.) parameters.

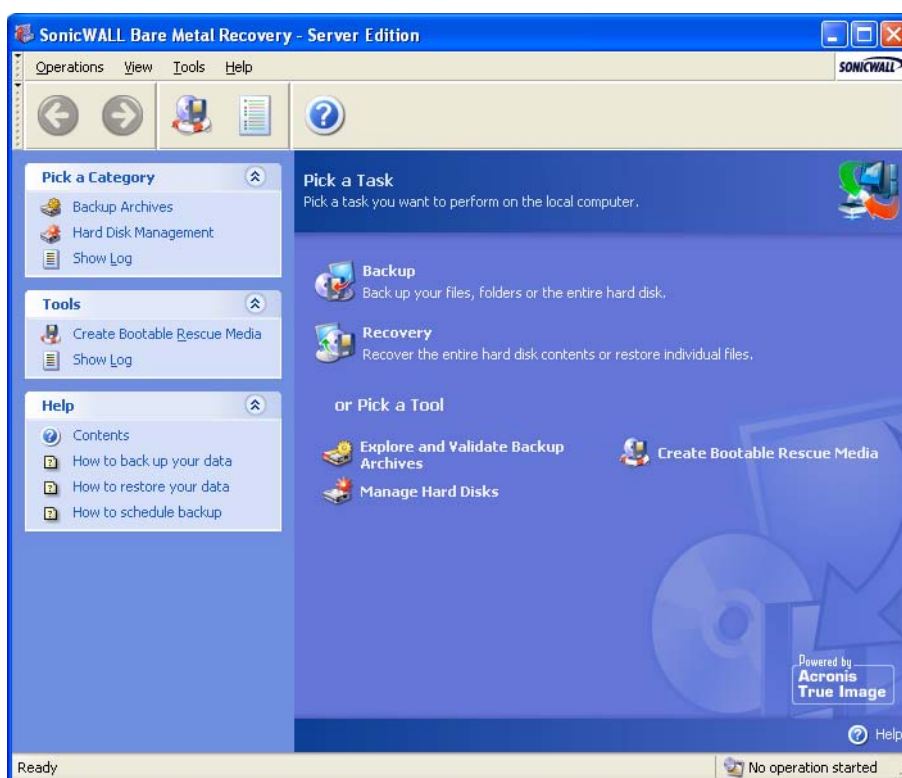
You can change the width of a column by dragging its borders with the mouse.

Chapter 4. Using SonicWALL Bare Metal Recovery

SonicWALL Bare Metal Recovery supports the GUI mode and the command-line mode. Here we describe the operations available in the GUI mode, which provides the widest functionality. For console commands and scripting please see [Chapter 13. Command-line mode and scripting](#).

4.1 Main program window

The main program window contains the menu, the toolbar, the sidebar and the main area. The sidebar features a pane for selecting task category, the **Tools** and **Help** panes. The main area displays operation icons or tasks depending on the category selected.



By default, the program displays operations included in the **Backup and Recovery** category. Operation icons are divided into three groups.

The **Task** group contains the following operations:

- **Backup** – create a backup archive
- **Recovery** – restore data from a previously created backup archive

The **Tools** group contains the following operations:

- **Explore and Validate Backup Archives** – explore file-level archives, mount disk/partition images as virtual drives, run the archive integrity checking procedure
- **Manage Hard Disks** – clone disk (i.e. transfer the OS, applications and data from the old disk to the new one) or mark out partitions on a new hard disk added for data storage with the OS and applications kept on the old one, convert basic disks to dynamic and create dynamic volumes

-
- **Create Bootable Rescue Media** – run the bootable media creation procedure

Program menu

The program menu bar features the **Operations**, **View**, **Tools** and **Help** items.

The **Operations** menu contains a list of the available operations, including scheduling tasks and mounting disk/partitions as virtual drives.

The **View** menu contains items for managing the program window look:

- **Toolbars** – contains commands that control toolbar icons
- **Common Task Bar** – enables/disables the sidebar
- **Status Bar** – enables/disables the status bar

The **Tools** menu contains the following items:

- **Explore Backup Archive** – explore backups
- **Validate Backup Archive** – run the archive integrity checking procedure
- **Consolidate archive** – applicable for archives containing more than one backups. This will create a consistent copy of the archive with an option to exclude backups that are no more needed
- **Convert Backup to Virtual Disk** - convert a disk image, created with the program (.tib), to a virtual disk file of the type you select (.vmdk, .vhd, .hdd)
- **Create Bootable Rescue Media** – run the bootable media creation procedure
- **Dynamic Volume Creation Wizard** – create dynamic volumes on basic or dynamic disks
- **Show Log** – open the Log Viewer window
- **Options** – open a window for editing default backup/restore options, setting text appearance (fonts), configuring e-mail or Windows pop-up notifications etc.

The **Help** menu is used to view help and obtain information about SonicWALL Bare Metal Recovery.

Most of the operations are represented two or even three times in different window areas, providing several ways to select them for more convenience. For example, you can start the necessary operation or tool by clicking its icon in the main area or by selecting the same item from the **Operations** or **Tools** menu.

Status bar

There is a status bar divided into two parts at the bottom of the main window. The left side briefly describes the selected operation; the right side indicates operation progress and results. If you double-click on the operation results, you will see the log window.

Taskbar notification area icon

During most of the operations, a special indicator icon appears in the Windows taskbar notification area. If you mouse over the icon, you will see a tool tip indicating the operation's progress. This icon doesn't depend on the main program window being open. It is present for background execution of scheduled tasks as well.

4.2 Available operations

You can perform the following operations.

Operation	How to access
Back up and Recover	
Back up and restore data, including system disks/partitions	Click Backup or Recovery , then follow the wizard's instructions. See details in Chapter 5. Creating backup archives and Chapter 6. Restoring the backup data .
Browse logs of SonicWALL Bare Metal Recovery operation	Click Show Log in the Tools menu or select the Show Log tool on the sidebar to navigate to the Event Log window. See details in 10.3 Viewing logs .
Set up default backup or restore options, such as system/network resources usage, before/after backup commands etc.	Select Tools -> Options -> Default backup options or Default restoration options and make settings. See details in 5.2 Setting backup options and in 6.4 Setting restore options
Set up default parameters for sending notifications about SonicWALL Bare Metal Recovery operation and tracing this operation in Windows Application Event Log	Select Tools -> Options -> Notifications or Event tracing and make settings. See details in Chapter 10. Notifications and event tracing .
Scheduling Tasks	
Schedule backup and archive validation operations	Click Tasks in the Manage Tasks group or select the Task Scheduling category on the sidebar to navigate to the Scheduled Tasks window. Then click the Create button on the toolbar and follow the wizard's instructions. See details in Chapter 7. Scheduling tasks .
Run, stop, edit, clone, rename, delete backup and archive validation tasks	Click Tasks in the Manage Tasks group or select the Task Scheduling category on the sidebar to navigate to the Scheduled Tasks window. See details in 7.2 Managing scheduled tasks .
Archives Management	
Explore any archive's contents and restore individual files from any archive	Select Tools -> Explore Backup Archive and follow the wizard's instructions. See details in 9.2.1 Exploring an archive .
Validate backup archives wherever they reside, be it local, network or removable media	Select Tools -> Validate Backup Archive , then follow the wizard's instructions. See details in 9.1 Validating backup archives .
Consolidate backup files inside an archive	Select Tools -> Consolidate archive , then follow the Wizard's instructions. See details in 9.4 Consolidating backups .

Convert disk images to virtual disk files of the type you select (.vmdk, .vhd, .hdd)	Select Tools -> Convert backup to Virtual Disk and follow the wizard's instructions. See details in 9.3 Converting disk images to virtual disks .
Mount partitions' images to explore and modify their contents, or to restore individual files	Select Operations -> Mount Image and follow the wizard's instructions. See details in 9.2.2 Mounting an image .
Unmount previously mounted partition images	Select Operations -> Unmount Image and follow the wizard's instructions. See details in 9.2.3 Unmounting an image .

Hard Disk Management

Create a dynamic volume	Select Tools -> Dynamic volume creation wizard , then follow the Wizard's instructions. See details in 6.5.1 Creating dynamic volumes .
Transfer the system to a new hard disk	See Chapter 11. Transferring the system to a new disk .
Format partitions on a new hard disk	See Chapter 12. Adding a new hard disk .

Other Tools

Create bootable rescue media, its ISO or RIS package	See Chapter 8. Creating bootable media .
--	--

Some of the above operations can be executed in command-line mode. For more information on SonicWALL Bare Metal Recovery command-line mode see [13.1 Working in the command-line mode](#).

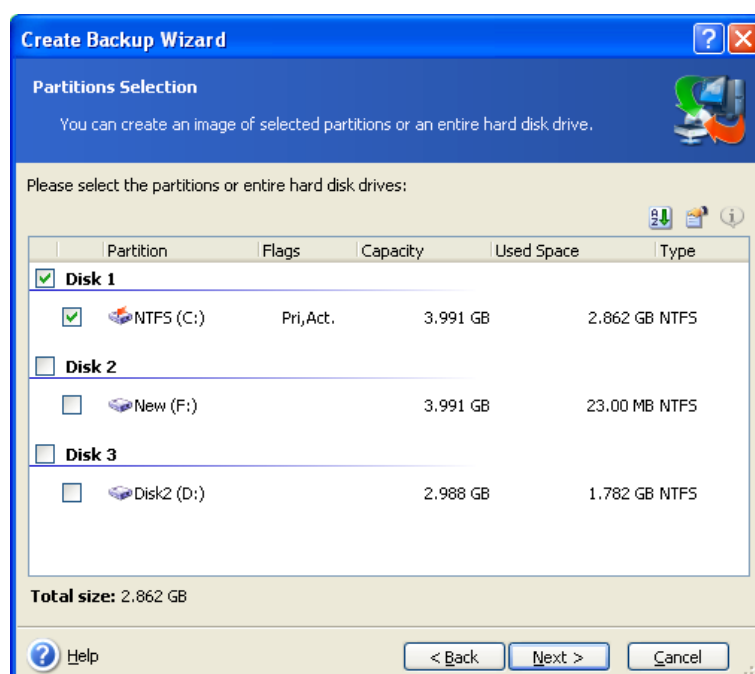
Chapter 5. Creating backup archives

To be able to restore the lost data or roll back your system to a predetermined state, you should first create a data or entire system backup file.

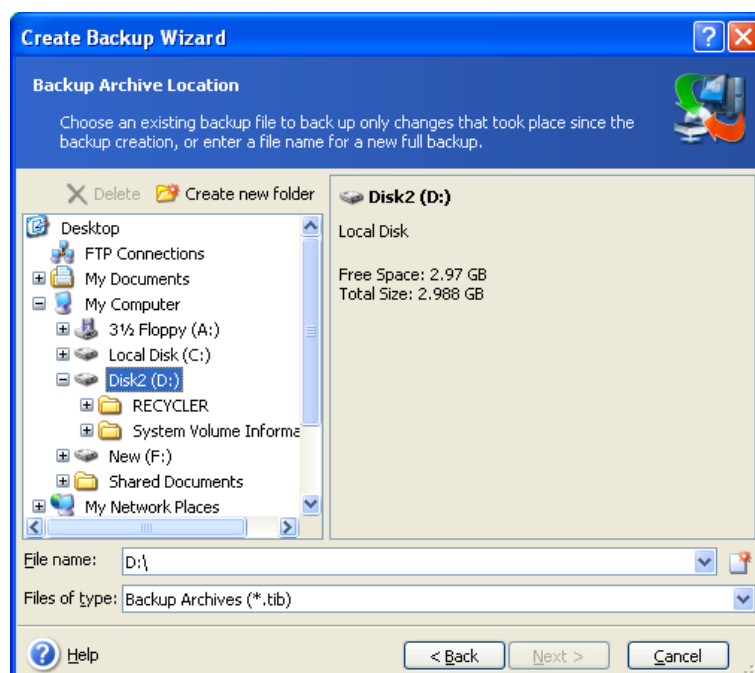
Backing up the entire system disk (creating a disk image) takes more disk space but enables you to restore the system in minutes in case of severe data damage or hardware failure. Moreover, the imaging procedure is much faster than copying files, and may significantly speed the backup process when it comes to backing up large volumes of data (see details in [3.1 The disk partition image](#)).

5.1 Backing up disks and partitions (image backup)

1. Start the **Create Backup Wizard** by clicking on the backup operation icon in the main program window.
2. Select disks, partitions or dynamic volumes to back up. You can select a random set of disks, partitions and dynamic volumes.



3. Select the name and location of the archive.



If you are going to create a full backup, type the file name in the **File Name** line, or use the file name generator (a button to the right of the line). If you select an existing full backup, it will be overwritten.

Including [date] in the backup file name will add to the name the time and date of the backup creation formatted as <DD-Month-YYYY HH:MM:SS>. Example: C:\MyBackup[date].tib.

If you are going to create an incremental backup (see [3.2 Full and incremental backups](#)), select the latest full or incremental backup you have.



In fact, if all incremental backup files are stored together with the basic full backup, it doesn't matter which one you select, as the program will recognize them as a single archive. If you stored the files on several removable disks, you must provide the latest archive file; otherwise, restoration problems might occur.

The “farther” you store the archive from the original partition, the safer it will be in case of data damage. For example, saving the archive to another hard disk will protect your data if your primary disk is damaged. Data saved to a network disk, ftp server or removable media will survive even if all your local hard disks are down.

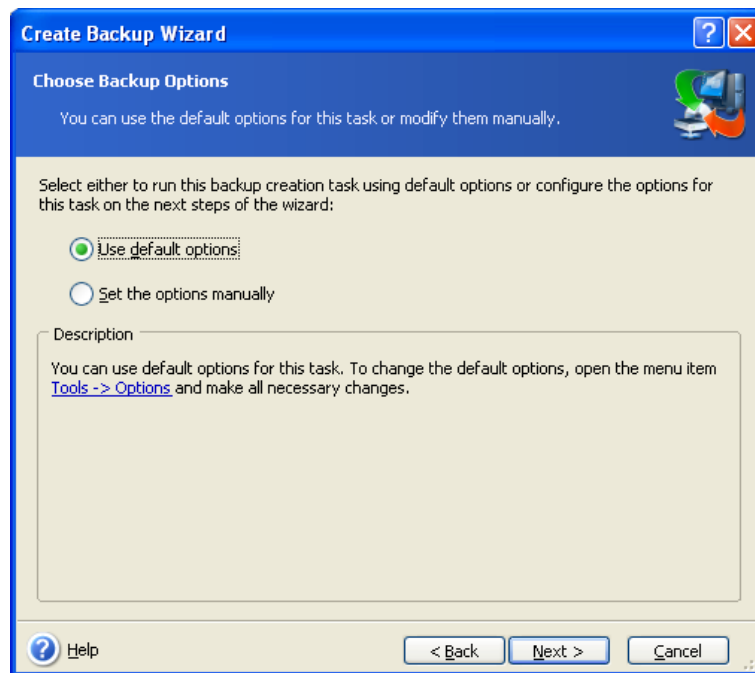
Dynamic volumes are fully supported as a backup destination place. SonicWALL Bare Metal Recovery can access backup archives, created on dynamic volumes, in standalone (rescue) mode as well as under Windows control.



See notes and recommendations for using the FTP server in [1.4.2 Supported storage media](#).

4. Select whether you want to create a full or incremental backup. If you have not backed up the selected disks/partitions yet, or the full archive seems too old to append incremental changes to it, choose full backup. Otherwise it is recommended that you create an incremental backup (see [3.2 Full and incremental backups](#)).

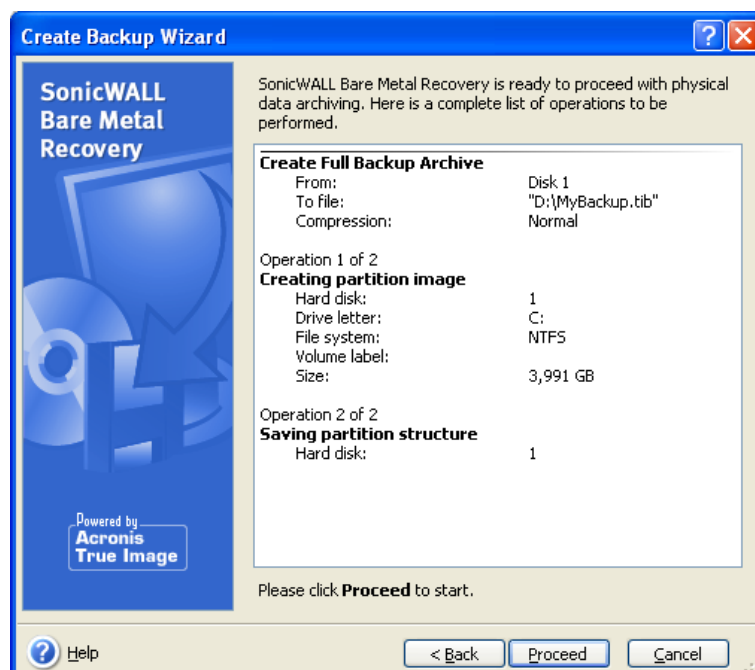
5. Select the backup options (that is, backup file splitting, compression level, password protection, pre/post backup commands etc.).



You may **Use default options** or **Set the options manually**. If the latter is the case, the settings will be applied only to the current backup task. Alternatively, you can edit the default options from the current screen. Then your settings will be saved as the defaults. See [5.2 Setting backup options](#) for more information.

6. Provide a comment for the archive. This can help prevent you from restoring the wrong disk or partition. However, you also can choose not to make any notes. The backup file size and creation date are automatically appended to the description, so you do not need to enter this information.

7. At the final step, the backup task summary is displayed. Up to this point, you can click **Back** to make changes in the created task. Clicking **Proceed** will launch the task.



8. The task progress will be shown in a special window. You can stop the procedure by clicking **Cancel**.

You can also close the progress window by clicking **Hide**. The backup creation will continue, but you will be able to start another operation or close the main program window. In the latter case, the program will continue working in the background and will automatically close once the backup archive is ready. If you prepare some more backup operations, they will be queued after the current.



You can adjust the backup process priority. To do so, click on the process icon in the System Tray and select Low, Normal, or High priority from the menu that appears. For information on how to set the default priority, see [5.2.5 Backup performance](#).

9. You may want to see the log when the task is completed. To view the log, click the **Show Operation Logs** button on the toolbar.

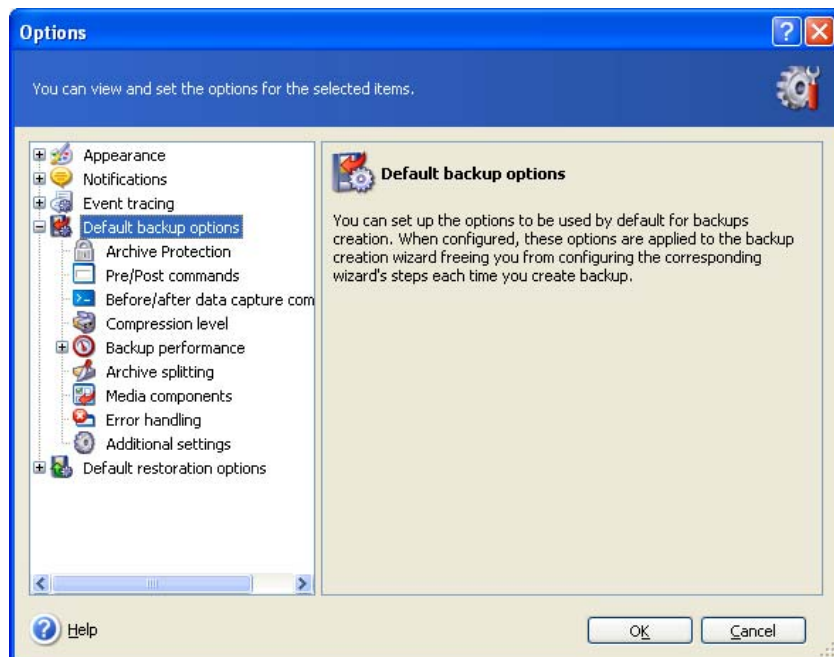


If you burn an archive to multiple removable media, be sure to number them, since you will have to insert them in order during the restoration.

5.2 Setting backup options

To view or edit the default backup options in SonicWALL Bare Metal Recovery, select **Tools -> Options -> Default Backup Options** from the main program menu.

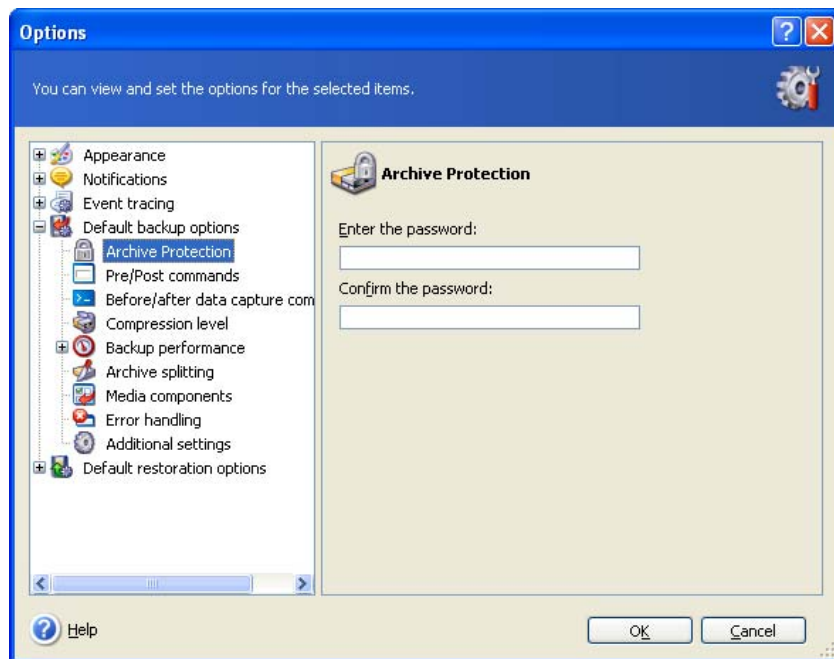
You can edit the default (or set the temporary) backup options while creating a backup task as well.



5.2.1 Archive protection

Password

The preset is **no password**.

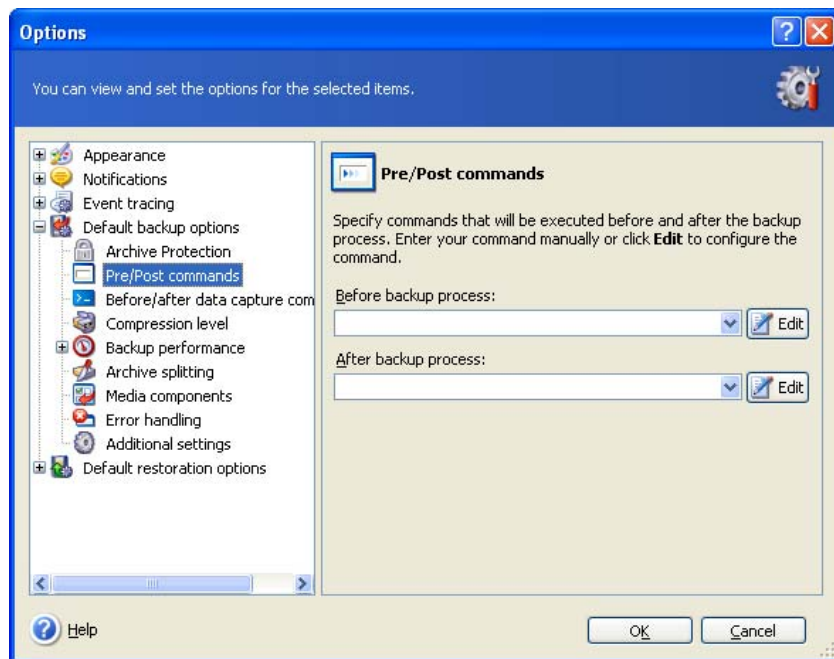


An archive can be protected with a password. To protect the archive data from being accessed by anybody except you, enter a password and its confirmation into the text fields. A password should consist of at least eight symbols and contain both letters (in the upper and lower cases preferably) and numbers to make it more difficult to guess.

If you try to restore data from a password-protected archive, or append an incremental backup to such an archive, SonicWALL Bare Metal Recovery will ask for the password in a special window, allowing access only to authorized users.

5.2.2 Pre/post commands

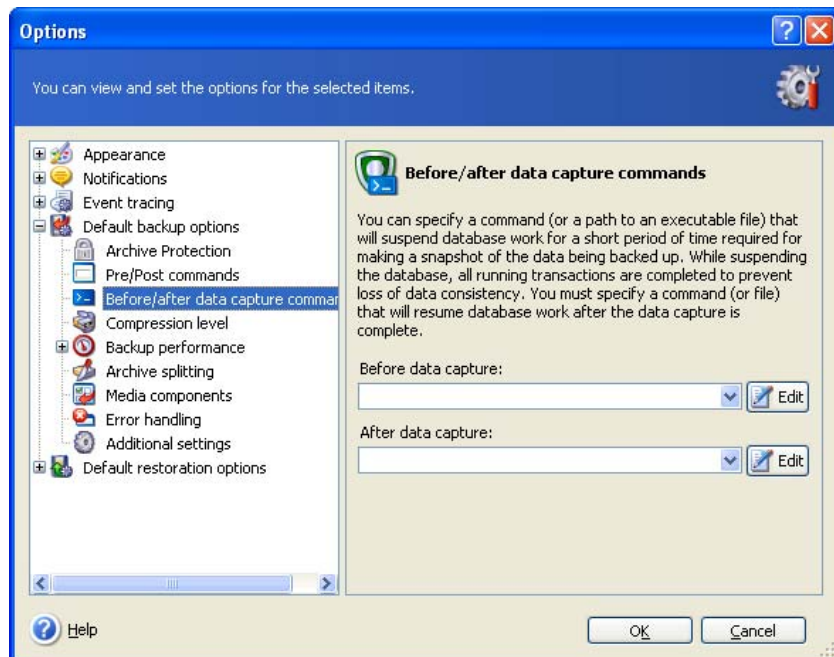
You can specify commands or batch files to be automatically executed before and after the *backup procedure*. For example, you may want to remove some .tmp files from the disk before starting backup or configure a third-party antivirus product to be started each time before the backup starts. Click **Edit** to open the **Edit Command** window where you can easily input the command, its arguments and working directory or browse folders to find a batch file.



5.2.3 Database support

Database servers, such as MS SQL Server and MS Exchange, can be problematic to backup, partially due to open files and indexes and partially due to rapid data changes. Therefore it is usually recommended that the database be suspended just before the backup (data capture). You can suspend the database and clear all caches to ensure that all transactions are completed at the moment of data capture. If it become necessary to restore a damaged database, it will be restored completely and be ready to access after recovery.

1. Before/after data capture commands



However, VSS is not available in server operation systems older than Windows 2003 Server, and not all databases support VSS. In these cases, the transactions completion

can be ensured by executing batch files or scripts that pause the appropriate Windows services and automatically resume them after data capture.

An example of a batch file, suspending the Windows services for MS Exchange:

```
net stop msexchange /y /y
net stop "Microsoft Exchange Routing Engine"
```

An example of a batch file, resuming the Windows services for MS Exchange:

```
net start "Microsoft Exchange System Attendant"
net start "Microsoft Exchange Event"
net start "Microsoft Exchange IMAP4"
net start "Microsoft Exchange MTA Stacks"
net start "Microsoft Exchange POP3"
net start "Microsoft Exchange Routing Engine"
```

Create batch files in any text editor (for example, name it *pause_services.bat* and *resume_services.bat*). Use **Edit** buttons to the right of **Before data capture command** and **After data capture command** fields, to open the **Edit Command** window where you can browse folders to find the respective batch files or scripts. A single command can be specified in the same window along with its arguments and working directory.

It is critical to note that these commands, as opposed to **Pre/post commands** above, will be executed before and after the *data capture* process, which takes seconds, while the entire backup procedure may take much longer, depending on the amount of data to be imaged. Therefore, the database idle time will be minimal.

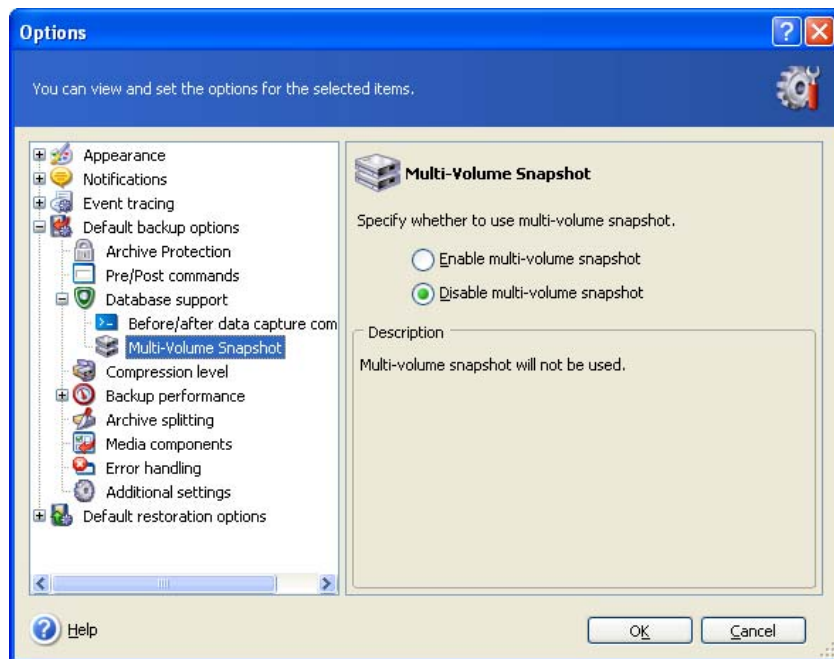
Before/after data capture commands can also be used for other purposes, especially if VSS support is enabled. You may want to suspend an application other than a database, for example. The commands execution and the VSS actions will be sequenced as follows:

"before" commands -> VSS Suspend -> data capture -> VSS Resume -> "after" commands.

The backup process will run concurrently with your commands if you uncheck the **Do not perform operations until the commands execution is complete** box, which is checked by default.

2. Multi-volume snapshot

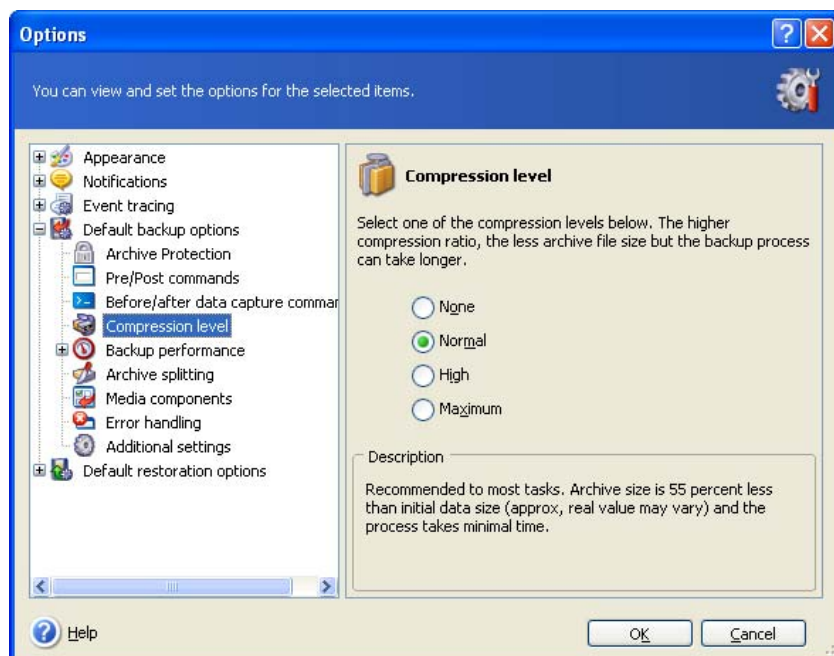
The preset is **disabled**.



Enable the **Multi-volume snapshot** feature if you are going to back up data located on multiple volumes and you must preserve its consistency (such as a database spanned across the volumes). In this case, a single snapshot for all volumes is created, which will be used for backup creation. When this feature is disabled, snapshots for volumes will be taken one by one.

5.2.4 Compression level

The preset is **Normal**.



The data will be copied without any compression, which may significantly increase the backup file size, if you select **None** as the compression level. However, if you select **Maximum** compression, the backup will take longer to create.

The optimal data compression level depends on the type of files stored in the archive. For example, even maximum compression will not significantly reduce the archive size if the

archive contains essentially compressed files, such as .jpg, .pdf or .mp3. However, formats such as .doc or .xls will compress more than other file types.

Generally, it is recommended that you use the default **Normal** compression level. You might want to select **Maximum** compression for removable media to reduce the number of blank disks required.

5.2.5 Backup performance

The three options below might have a more or less noticeable effect on the backup process speed. This depends on overall system configuration and physical characteristics of devices.

1. Backup process priority

The preset is **Low**.

The priority of any process running in a system determines the amount of CPU usage and system resources allocated to that process. Decreasing the backup priority will free more resources for other CPU tasks. Increasing the backup priority may speed up the backup process due to taking resources from the other currently running processes. The effect will depend on total CPU usage and other factors.

2. HDD writing speed

The preset is **Maximum**.

Backing up in the background to an internal hard may slow other programs' performance because of the large amounts of data transferred to the disk. You can limit the hard disk usage by SonicWALL Bare Metal Recovery to the desired level. To set the desired HDD writing speed for data being backed up, drag the slider or enter the writing speed in kilobytes per second.

3. Network connection speed

The preset is **Maximum**.

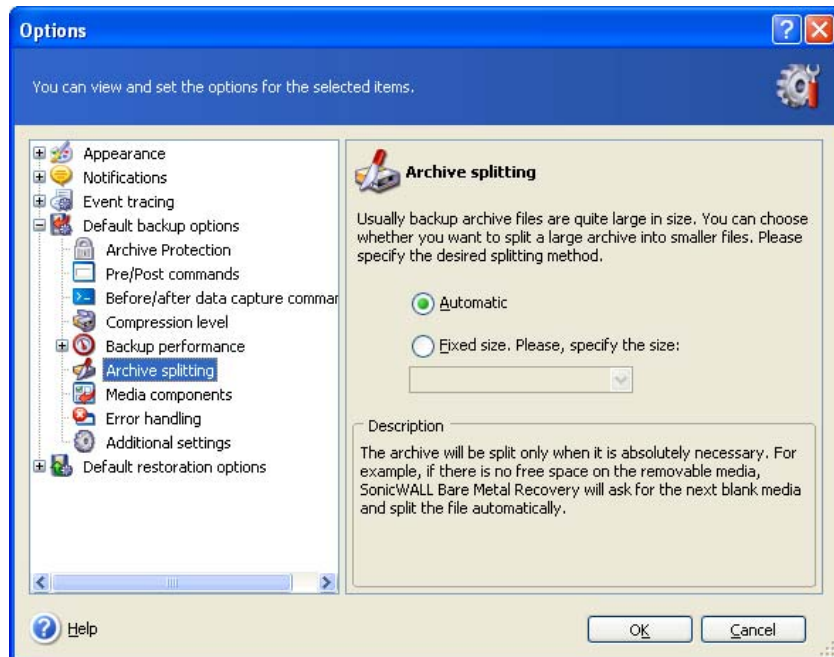


If you frequently backup data to network drives, think of limiting the network usage used by SonicWALL Bare Metal Recovery. To set the desired data transfer speed, drag the

slider or enter the bandwidth limit for transferring backup data in kilobytes per second. This setting is also applied to an FTP connection, if an FTP server is selected as backup destination device.

5.2.6 Archive splitting

Sizeable backups can be split into several files that together make the original backup. A backup file can be split for burning to removable media or saving on an FTP server (data recovery directly from an FTP server requires the archive to be split into files no more than 2GB in size).



The preset is **Automatic**. With this setting, SonicWALL Bare Metal Recovery will act as follows:

When backing up to the hard disk: The program will create a single archive file if the selected disk has enough space and its file system allows the estimated file size.

The program will automatically split the backup into several files if the storage disk has enough space, but its file system does not allow the estimated file size.



FAT16 and FAT32 file systems have a 4GB file size limit. However, the existing hard drive's capacity can reach as much as 2TB. Therefore, an archive file might easily exceed this limit if you are going to back up the entire disk.

If you do not have enough space to store the backup on your hard disk, the program will warn you and wait for your decision as to how you plan to fix the problem. You can try to free some additional space and continue or click **Back** and select another disk.

When backing up to a diskette, CD-R/RW or DVD±R/RW: SonicWALL Bare Metal Recovery will ask you to insert a new disk when the previous one is full.

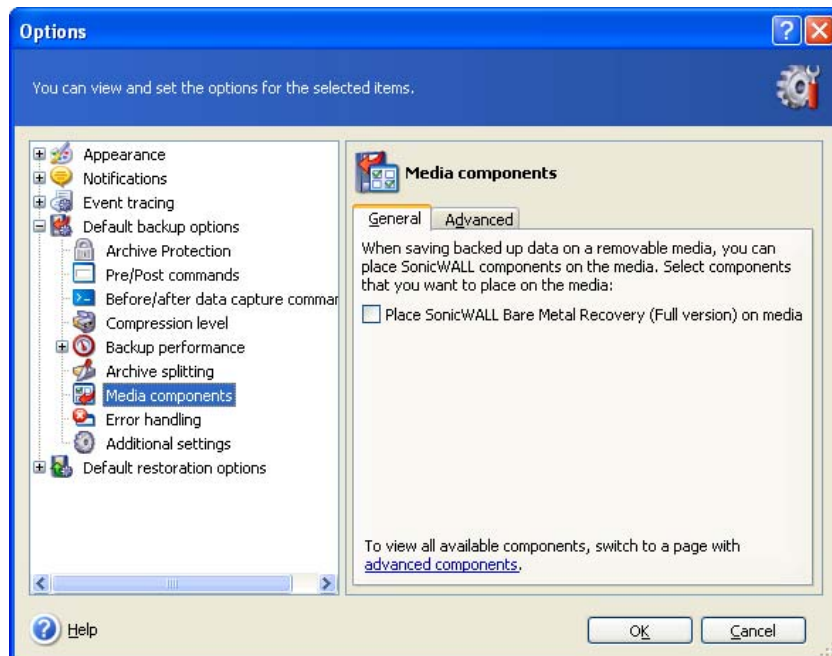
Alternatively, you can select **Fixed size** and enter the desired file size or select it from the drop-down list. The backup will then be split into multiple files of the specified size. That comes in handy when backing up to a hard disk with a view to burning the archive to CD-R/RW or DVD±R/RW later on.



Creating a backup directly on CD-R/RW or DVD±R/RW generally will take considerably more time than it would on a hard disk.

5.2.7 Media components

The preset is **disabled**.



When backing up to removable media, you can make this media bootable by writing to it additional components. As a result, you will not need a separate rescue disk.

Choose the basic components necessary for boot and restoring data on the **General** tab.

If you want more functionality during restoration, write a standalone version of **SonicWALL Bare Metal Recovery** to the rescue disk. Then you will be able to configure the restore task using Restore Data Wizard, use SonicWALL Universal Restore.

The **Advanced** tab lets you select full, safe or both SonicWALL Bare Metal Recovery loader versions. The safe version does not have USB, PC card or SCSI drivers and is useful only in cases where the full version does not load.

5.2.8 Error handling

1. Ignore bad sectors

The preset is **disabled**.

With the default setting, the program will display a pop-up window each time it comes across a bad sector and ask for user decision whether to continue or stop the backup procedure. In order to back up the valid information on a rapidly dying disk, enable ignoring bad sectors. The rest of the data will be backed up and you will be able to mount the image and extract valid files to another disk.

2. Do not show messages and dialogs while processing ("silent" mode)

The preset is **disabled**.

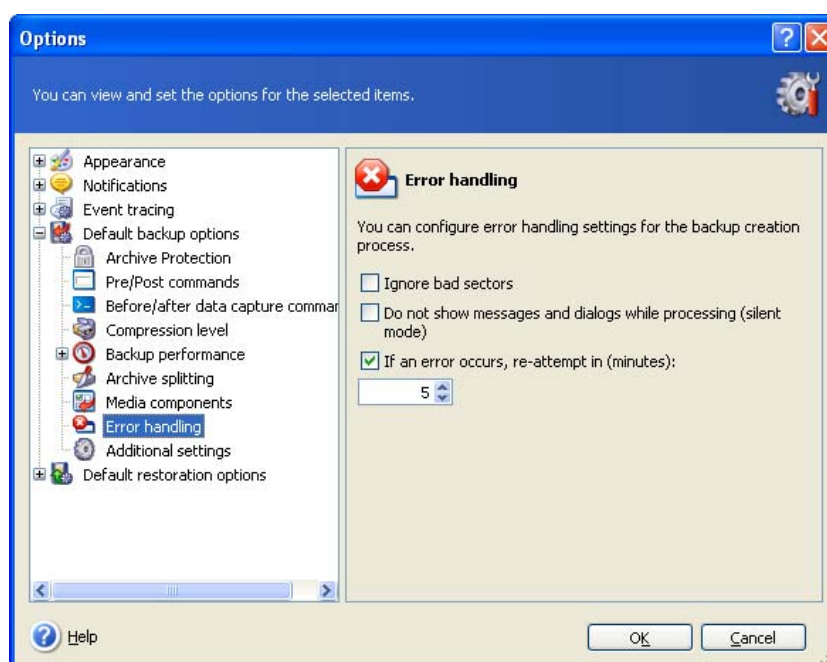
Corporate administrators need an option to continue a back up despite any errors that might occur without the system popping up an error box. Details of the operation, including errors, if any, could be found in the operation log.

With the silent mode enabled, the program will not display interactive windows. Instead, it will automatically handle situations requiring user intervention such as running out disk space (except for handling bad sectors, which is defined as a separate option.) No prompts will be displayed, including those for removable media. If an operation cannot continue without user action, it will fail.

Therefore, enable this feature if you do not want unattended backup operations hang on pop-ups and errors.

3. If an error occurs, re-attempt in (minutes)

The preset is **enabled**.



When the backup destination location on the network is not available or not reachable, the program will attempt to reach the location at the specified time interval.

5.2.9 Additional settings

1. Validate backup archive upon operation completion

The preset is **disabled**.

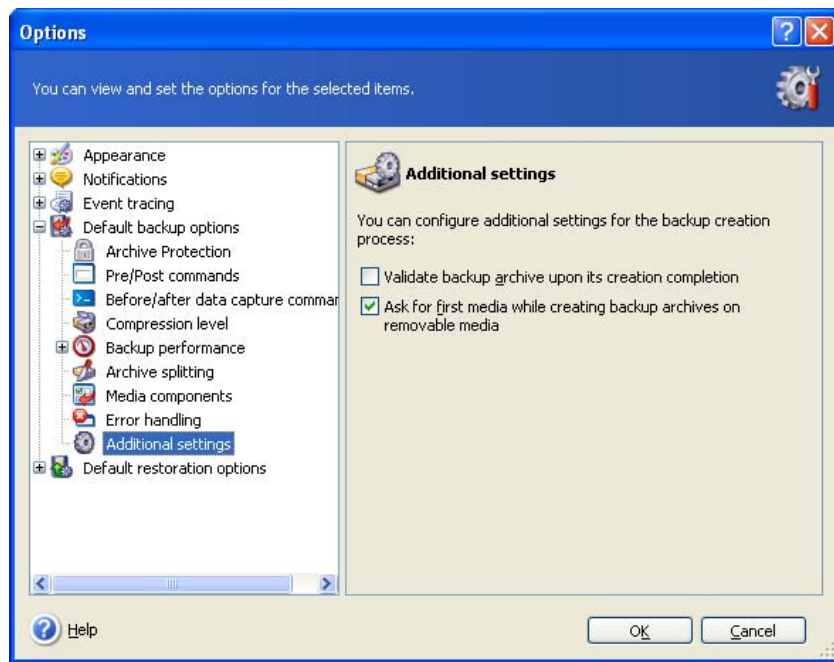
The program will check integrity of the just created or supplemented archive immediately after backup when enabled.



To check archive data integrity, you must have all incremental backups belonging to the archive and the initial full backup. If any of successive backups is missing, validation is not possible.

2. Ask for first media while creating backup archives on removable media

The preset is **enabled**.



You can choose whether to display the **Insert First Media** prompt when backing up to removable media. With the default setting, backing up to removable media may be not possible if the user is away, because the program will wait for someone to press **OK** in the prompt box. Therefore, you should disable the prompt when scheduling a backup to removable media. Then, if the removable media is available (for example, CD-R/RW inserted), the task can run unattended.

Chapter 6. Restoring the backup data

6.1 Considerations before recovery

6.1.1 Restore under Windows or boot from CD?

As mentioned above (see [2.3 Running SonicWALL Bare Metal Recovery](#)), SonicWALL Bare Metal Recovery can be run in several ways. We recommend that you first try to restore data running SonicWALL Bare Metal Recovery under Windows because this method provides more functionality. Boot from the bootable media only if Windows does not load.

The boot CD from which you loaded the program does not keep you from using other CDs with backups. SonicWALL Bare Metal Recovery is loaded entirely into RAM, so you can remove the bootable CD to insert the archive disk.

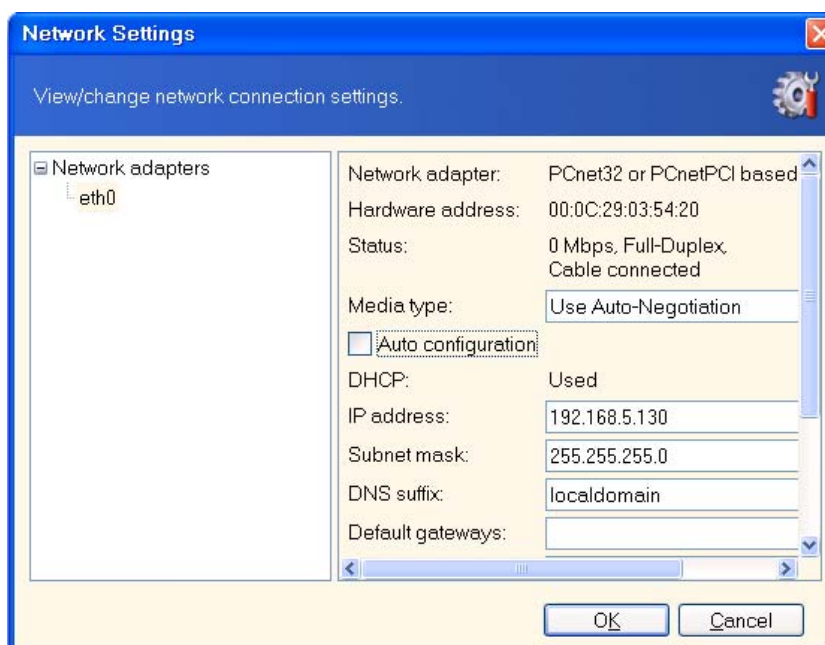


Be careful! Disk letters in standalone SonicWALL Bare Metal Recovery might sometimes differ from the way Windows identifies drives. For example, the D: drive identified in the standalone SonicWALL Bare Metal Recovery might correspond to the E: drive in Windows.

6.1.2 Network settings in rescue mode

When booted from removable media or RIS server, SonicWALL Bare Metal Recovery may not detect the network. This can occur if there is no DHCP server in your network or if your computer address was not identified automatically for some reason.

To enable a network connection, specify network settings manually in the window available at **Tools -> Options -> Network adapters**.



6.1.3 Recovering dynamic volumes

Dynamic volumes are volumes located on dynamic disks, i.e. disks managed by Windows Logical Disk Manager (LDM). For more information on dynamic disks, please refer to your Windows documentation.

SonicWALL Bare Metal Recovery Universal Enterprise Server can back up and recover dynamic volumes.

A dynamic volume can be recovered over the same volume or unallocated space of a dynamic group. If recovered over another volume, the target volume's contents will be overwritten with the image contents, but the type or other properties of the target volume will not be changed.

To restore a dynamic volume exactly as it is, prepare a target dynamic group without volumes. In case you want to restore a dynamic volume in place of some volumes already existing on the target disks, delete the original volumes using third-party tools, such as the Windows Disk Management tool.

Dynamic volume contents alone can be recovered onto a basic or dynamic volume without changing the target volume type. SonicWALL Bare Metal Recovery Universal Enterprise Server has the **Dynamic Volume Creation Wizard** tool so that you be able to prepare the desired volumes on the target disks.

Backward conversion of dynamic volume to basic disks can be performed, if need be, using the **Add new disk** operation (see [Chapter 12. Adding a new hard disk](#)).

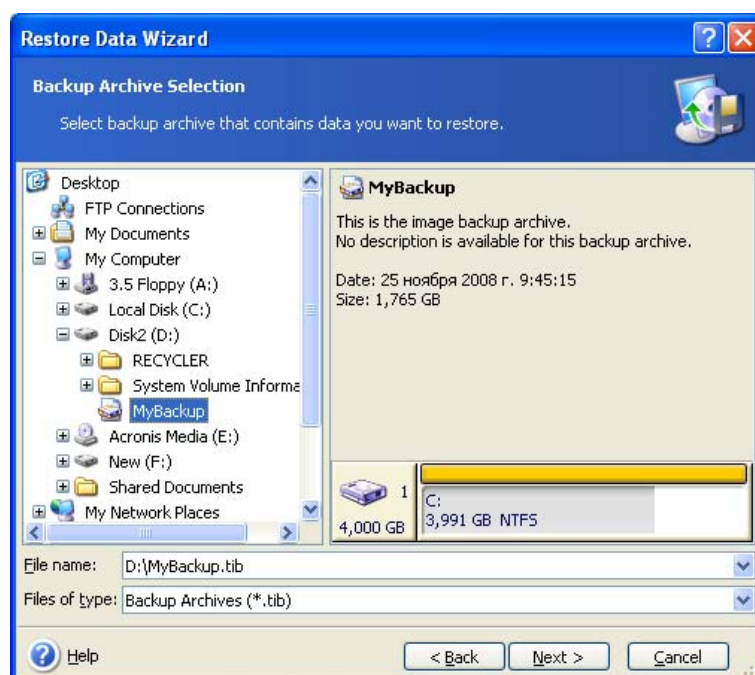
With these tools, anywhere-to-anywhere data recovery becomes available, in terms of basic disks and dynamic volumes of any type (simple, spanned, striped, mirrored or RAID 5). The tools are available in bootable program version. Having booted the SonicWALL environment, you can easily prepare the desired dynamic group on bare metal or a computer with non-Windows operating system.

For how to use the above tools see [6.5 Creating dynamic disks and volumes](#).

6.2 Restoring files and folders from images

Here we describe how to restore files/folders from a disk/partition image. To do so, mount the image (see [9.2.2 Mounting an image](#)) or start the image restoration and select **Restore specified files or folders**.

1. Start the **Restore Data Wizard** by clicking on the restore operation icon in the main program window.
2. Select the archive.





If the archive is located on removable media, e.g. CD, first insert the last CD and then insert disks in reverse order when Restore Data Wizard prompts.



Data recovery directly from an FTP server requires the archive to consist of files no more than 2GB in size. If you suspect that some of the files may be larger, first copy the entire archive (along with the initial full backup) to a local hard disk or network share disk. See notes and recommendations for supporting FTP server in [1.4.2 Supported storage media](#).

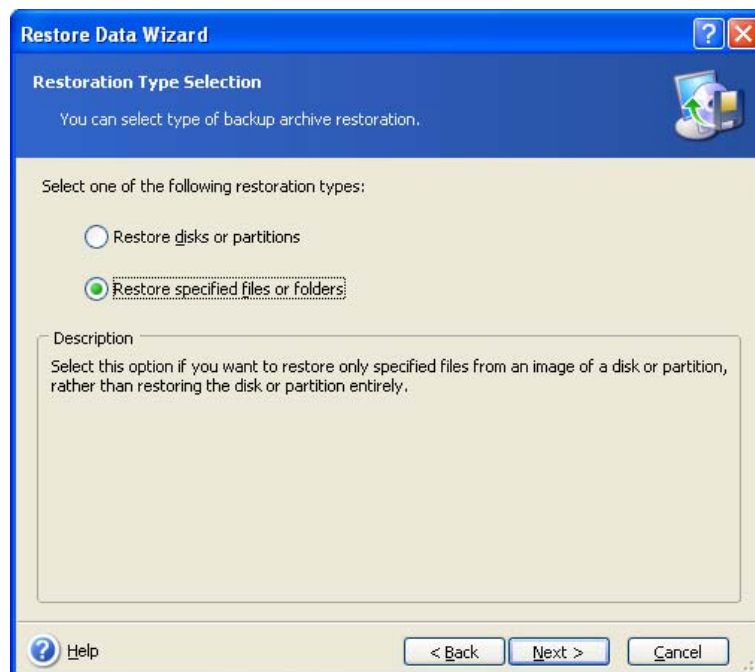
If you added a comment to the archive, it will be displayed to the right of the drives tree. If the archive was protected with a password, SonicWALL Bare Metal Recovery will ask for it. The comment and the **Next** button will be unavailable until you enter the correct password.

3. If the selected archive contains incremental backups, SonicWALL Bare Metal Recovery will suggest that you select one of successive incremental backups by its creation date/time. Thus, you can return the files/folders to a specific time and date.



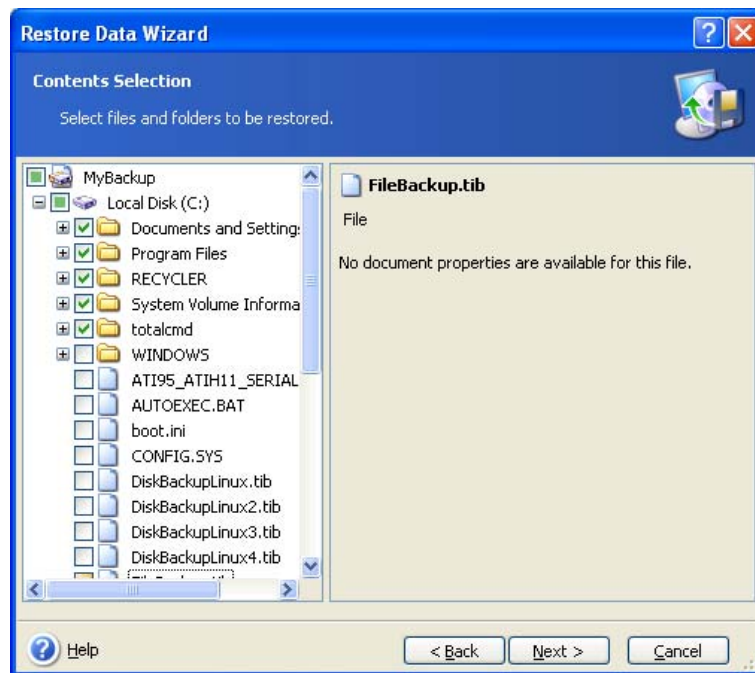
To restore data from an incremental backup, you must have all previous incremental backups and the initial full backup. If any of successive backups is missing, restoration is not possible.

4. Select the restoration of specified files or folders:



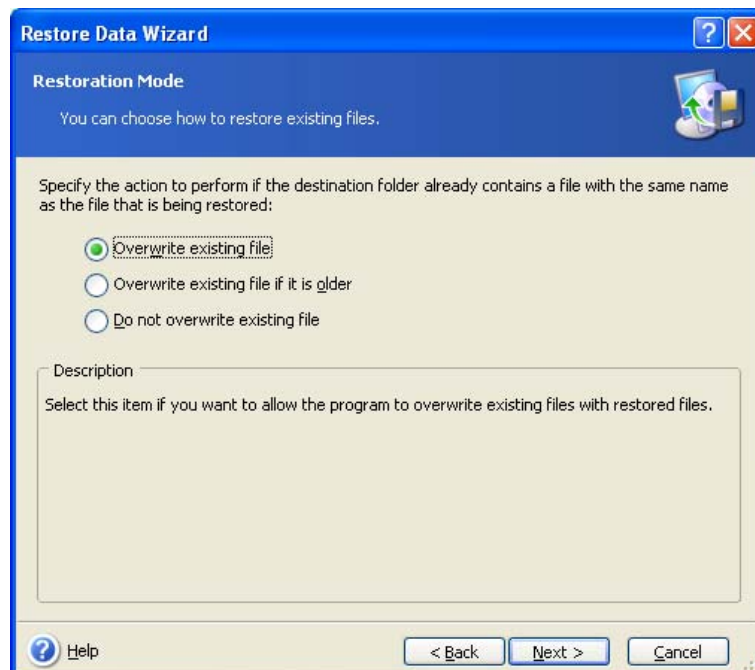
5. Select a folder on your computer where you want to restore selected folders/files (a target folder). You can restore data to their original location or choose another folder, if necessary.

6. Select files and folders to restore. You can choose to restore all data or browse the archive contents and select the desired folders or files.



7. Select the options for the restoration process (that is, pre/post restoration commands, restoration process priority, file-level security settings etc.). You may **Use default options** or **Set the options manually**. If you set options manually, the settings will be applied only to the current restore task. Alternatively, you can edit the default options from the current screen. Then your settings will be saved as default. See [6.4 Setting restore options](#) for more information.

8. The next selection allows you to keep useful data changes made since the selected backup was created. Choose what to do if the program finds in the target folder a file with the same name as in the archive.

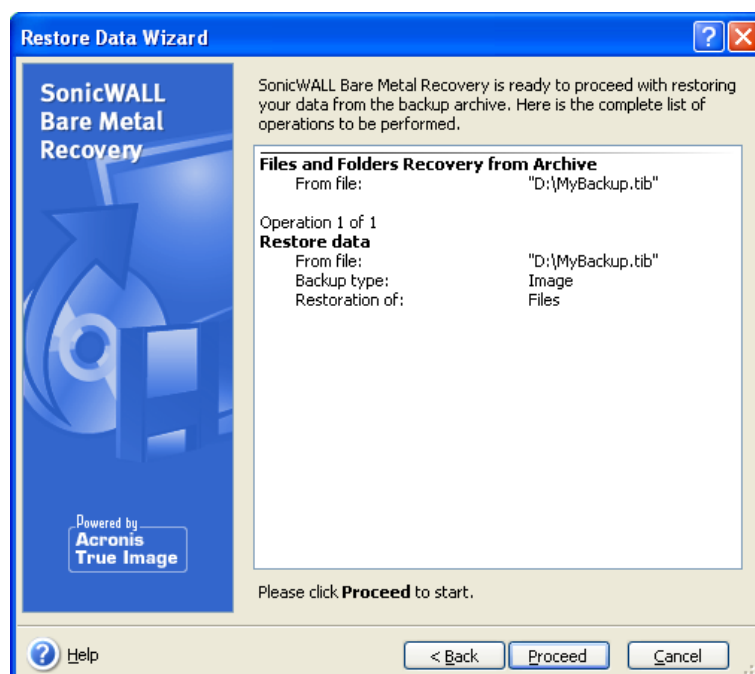


Overwrite existing file – this will give the archived file unconditional priority over the file on the hard disk.

Overwrite existing file if it is older – this will give the priority to the most recent file modification, whether it be in the archive or on the disk

Do not overwrite existing file – this will give the file on the hard disk unconditional priority over the archived file.

9. At the final step, the restoration summary is displayed. Up to this point, you can click **Back** to make changes in the created task.



Clicking **Proceed** will launch the task.

10. The task progress will be shown in a special window. You can stop the procedure by clicking **Cancel**. Please keep in mind that the aborted procedure still may cause changes in the destination folder.

6.3 Restoring disks/partitions from images

To restore a partition (disk) from an image, SonicWALL Bare Metal Recovery must obtain **exclusive access** to the target partition (disk). This means no other applications can access it at that time. If you receive a message stating that the partition (disk) can not be blocked, close applications that use this partition (disk) and start over. If you can not determine which applications use the partition (disk), close them all.

6.3.1 Starting the Restore Data Wizard

Start the **Restore Data Wizard** by clicking on the restore operation icon in the main program window.

6.3.2 Archive selection

1. Select the archive.



If the archive is located on removable media, e.g. CD, first insert the last CD and then insert disks in reverse order when Restore Data Wizard prompts.



Data recovery directly from an FTP server requires the archive to be split into files no more than 2GB in size. If you suspect that some of the files may be larger, first copy the entire archive (along with the initial full backup) to a local hard disk or network share disk. See notes and recommendations for supporting FTP server in [1.4.2 Supported storage media](#).

If you added a comment to the archive, it will be displayed to the right of the drives tree. If the archive was protected with a password, SonicWALL Bare Metal Recovery will ask for it. The partitions layout, the comment and the **Next** button will be unavailable until you enter the correct password.

2. If the selected archive contains incremental backups, SonicWALL Bare Metal Recovery will suggest that you select one of successive incremental backups by its creation date/time. Thus, you can return the disk data to a certain moment.

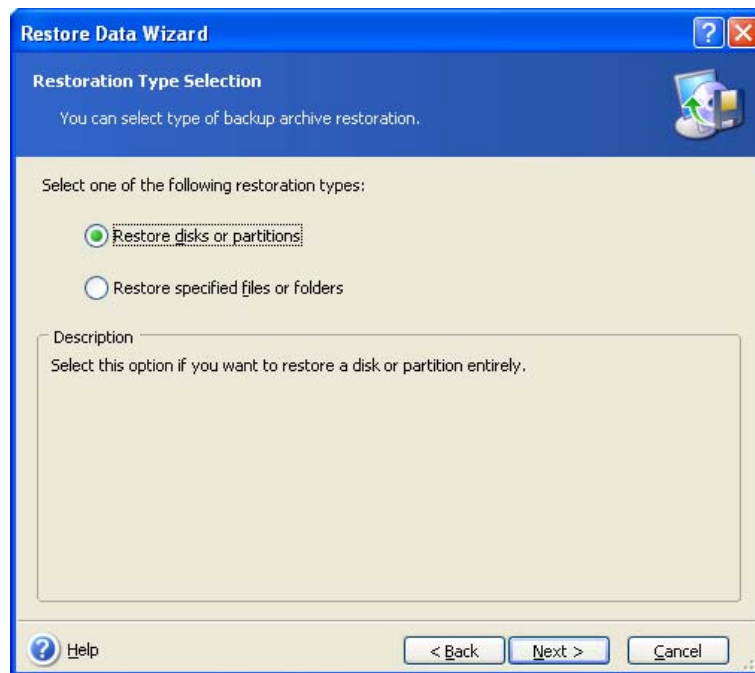


To restore data from an incremental backup, you must have all previous incremental backups and the initial full backup. If any of successive backups is missing, restoration is not possible.

2. If the selected archive contains incremental backups, SonicWALL Bare Metal Recovery will suggest that you select one of successive incremental backups by its creation date/time. Thus, you can return the disk data to a certain moment.

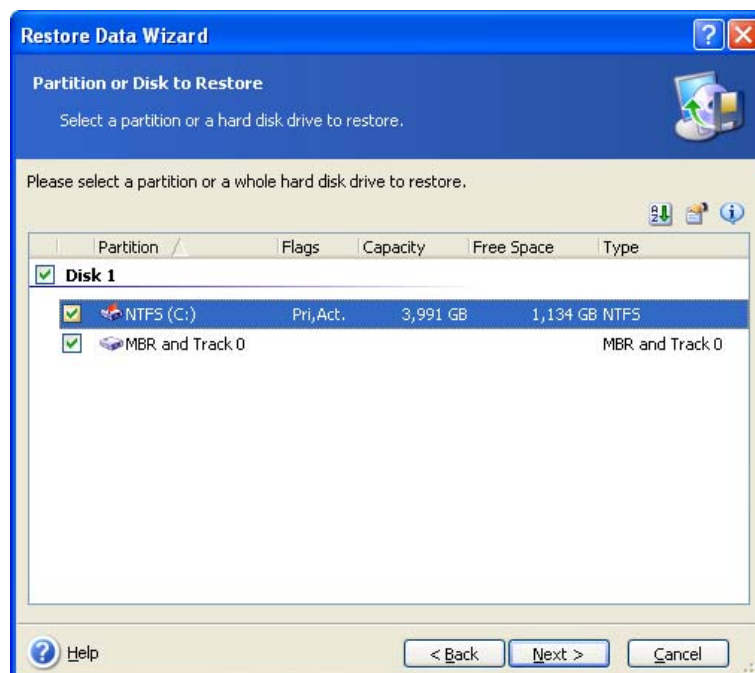
6.3.3 Restoration type selection

Select the restoration of disks or partitions:



6.3.4 Selecting a disk/partition to restore

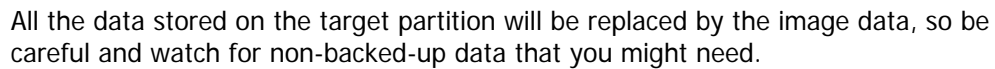
The selected backup can contain images of several partitions or even disks. Select which disk/partition to restore.



Disks and partitions images contain a copy of track 0 along with the MBR (Master Boot Record). It appears in this window in a separate line. You can choose whether to restore MBR and track 0 by checking the respective box. Restore the MBR if it is critical to your system boot.

6.3.5 Selecting a target disk/partition

1. Select a target disk or partition where you want to deploy the selected image. You can restore data to its initial location, to another disk/partition or to an unallocated space. The target partition should be at least the same size as the uncompressed image data.



If the chipset, motherboard or mass storage devices are different, there is a risk that the system will not be able to boot.

Restore Data Wizard

Restored Hard Disk Drive Location

You should select a hard disk drive for the restore.

Please select a destination hard disk drive to restore the hard disk drive image. The hard disk drives already restored are disabled. The destination hard disk drives without enough space for restoring an image are disabled as well.

Drive	Capacity	Model	Interface
Disk 1	4,000 GB	VMware Virtual IDE H 0000	IDE(0) Primary Master
Disk 2	4,000 GB	VMware Virtual IDE H 0000	IDE(0) Secondary Master
Disk 3	3 GB	VMware, VMware Virtual S1.0	SCSI

4,000 GB U. 7.. New (F:) 3,991 GB NTFS

☒ Primary ☐ Logical ☐ Unallocated ☐ Dynamic Volume ☐ Unsupported

[? Help](#) [< Back](#) [Next >](#) [Cancel](#)

You will have to select between:

- Note that no real changes or data destruction will be performed at this time! For now, the program will just map out the procedure. All changes will be implemented only when you click **Proceed** in the wizard's final window.

6.3.6 Changing the restored partition type

43

To illustrate why you might need to do this, let's imagine that both the operating system and data were stored on the same primary partition on a damaged disk.

If you are restoring a system partition to the new (or the same) disk and want to load an operating system from it, you will select **Active**.

If you restore a system partition to another hard disk with its own partitions and OS, most likely you will need only the data. In this case, you can restore the partition as **Logical** to access the data only.

By default, the original partition type is selected.



Selecting **Active** for a partition without an installed operating system could prevent your server from booting.

6.3.7 Changing the restored partition size and location

You can resize and relocate a partition by dragging it or its borders with a mouse or by entering corresponding values in the appropriate fields.

Using this feature, you can redistribute the disk space between partitions being restored. In this case, you will have to restore the partition to be reduced first.



These changes might be useful if you are to copy your hard disk to a new, high-capacity one by creating its image and restoring it to a new disk with larger partitions.

6.3.8 Assigning a letter to the restored partition

SonicWALL Bare Metal Recovery will assign an unused letter to a restored partition. You can select the desired letter from a drop-down list. If you set the switch to **No**, no letters will be assigned to the restored partition, hiding it from OS.

You should not assign letters to partitions inaccessible to Windows, such as to those other than FAT and NTFS.

6.3.9 Restoring several disks or partitions at once

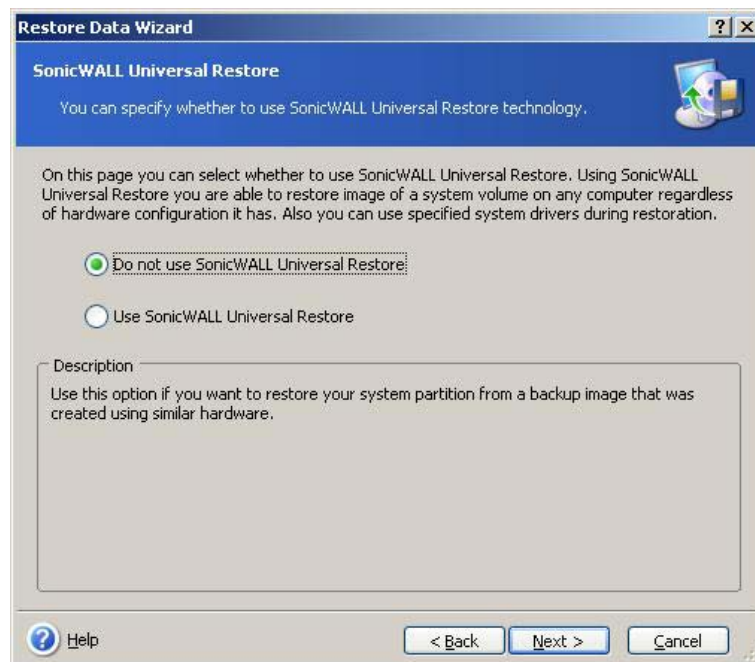
During a single session, you can restore several partitions or disks, one by one, by selecting one disk and setting its parameters first and then repeating these actions for every partition or disk to be restored.

If you want to restore another disk (partition), select **Yes, I want to restore another partition or hard disk drive**. Then you will return to the partition selection window (7.3.4) again and will have to repeat the above steps. Otherwise, do not set this switch.

6.3.10 Using SonicWALL Universal Restore

SonicWALL Universal Restore is an option to SonicWALL Bare Metal Recovery Server Edition. It is purchased separately and included into the SonicWALL Bare Metal Recovery Universal Enterprise Server. The following is true for SonicWALL Bare Metal Recovery Universal Enterprise Server installations including SonicWALL Universal Restore.

1. Using SonicWALL Universal Restore will help you create a bootable system clone on different hardware (for more information see [3.3 SonicWALL Universal Restore](#)). Choose this when restoring a system disk to a computer with a dissimilar processor, different motherboard or other mass storage device than in the imaged system.



2. If the target hardware has a specific mass storage controller (such as a SCSI, RAID, or Fibre Channel adapter) for the hard disk, you can install the appropriate driver manually, bypassing the automatic driver search-and-install procedure.

Use this option only if the automatic search-and-install procedure was unsuccessful.

SonicWALL Universal Restore uses three sources for drivers:

- the driver repository - a folder or folders on a network drive or CD specified in restore options. If you have not specified the driver repository in advance, you can do it at next step.
- the mass storage device driver specified by the user at the current step
- the Windows default driver storage folders (in the image being restored).

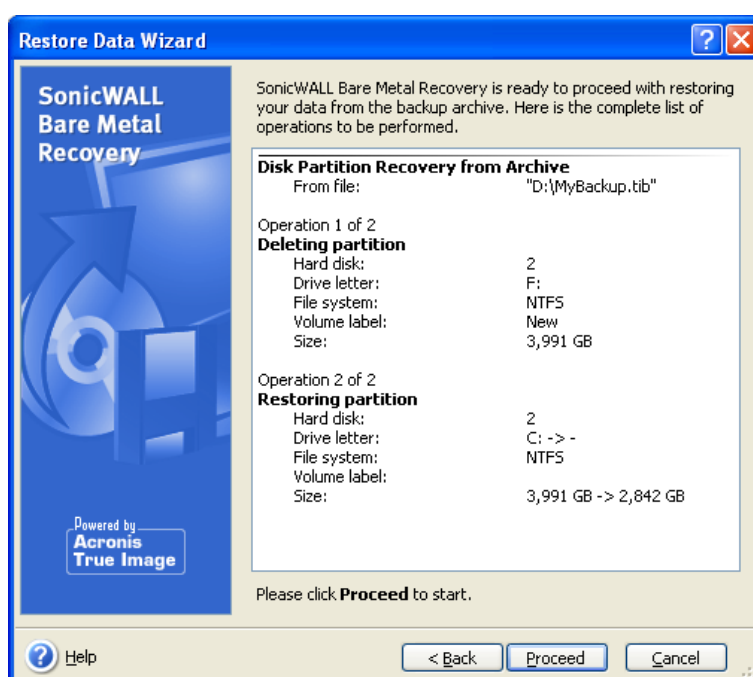
The program will find the most suitable drivers of all available drivers and install them into the restored system. However, the driver defined by the user, will have the priority. It will be installed, with appropriate warnings, even if the program finds the better driver.

6.3.11 Setting restore options

Select the options for the restoration process (that is, pre/post restoration commands, restoration process priority etc.). You may **Use default options** or **Set the options manually**. If you set the options manually, the settings will be applied only to the current restore task. Alternatively, you can edit the default options from the current screen. Then your settings will be saved as default. See 6.4 *Setting restore options* for more information.

6.3.12 Restoration summary and executing restoration

1. At the final step, the restoration summary is displayed.



Up to this point, you can click **Back** to make changes in the created task. If you click **Cancel**, no changes will be made to disk(s). Clicking **Proceed** will launch the task execution.

2. The task progress will be shown in a special window.

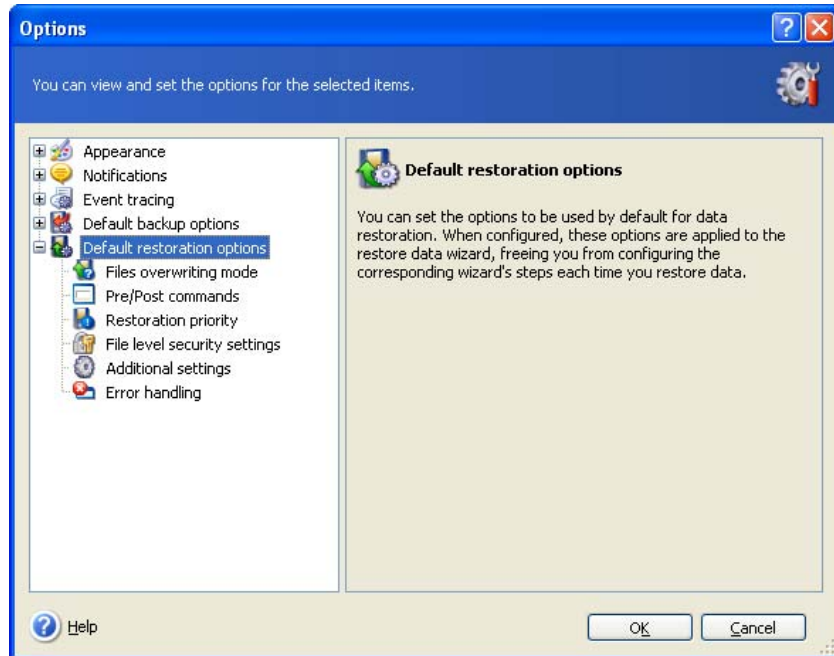
You can stop the procedure by clicking **Cancel**. However, it is critical to note that the target partition will be deleted and its space unallocated – the same result you will get if the restoration is unsuccessful. To recover the “lost” partition, you will have to restore it from the image again.

If SonicWALL Universal Restore finds no Hardware Abstraction Layer (HAL) or mass storage devices drivers compatible with the new hardware in all available sources, you will be prompted to browse to a network share drive or insert a floppy disk or CD with the necessary drivers. Upon starting Windows, it will initialize the standard procedure for installing new hardware. At this point, you will be able to specify drivers for devices if Windows cannot find them automatically.

6.4 Setting restore options

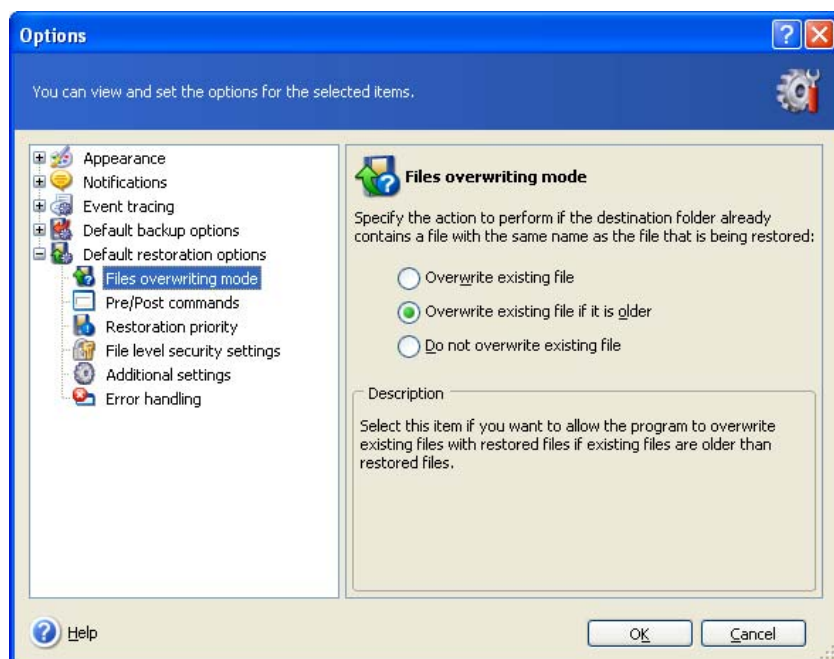
To view or edit the default restore options in SonicWALL Bare Metal Recovery, select **Tools -> Options -> Default Restoration Options** from the main program menu.

You can edit the default (or set the temporary) restore options while creating a restore task as well.



6.4.1 Files overwriting mode

This option allows you to keep useful data changes made since the backup being restored was done. Choose what to do if the program finds in the target folder a file with the same name as in the archive.



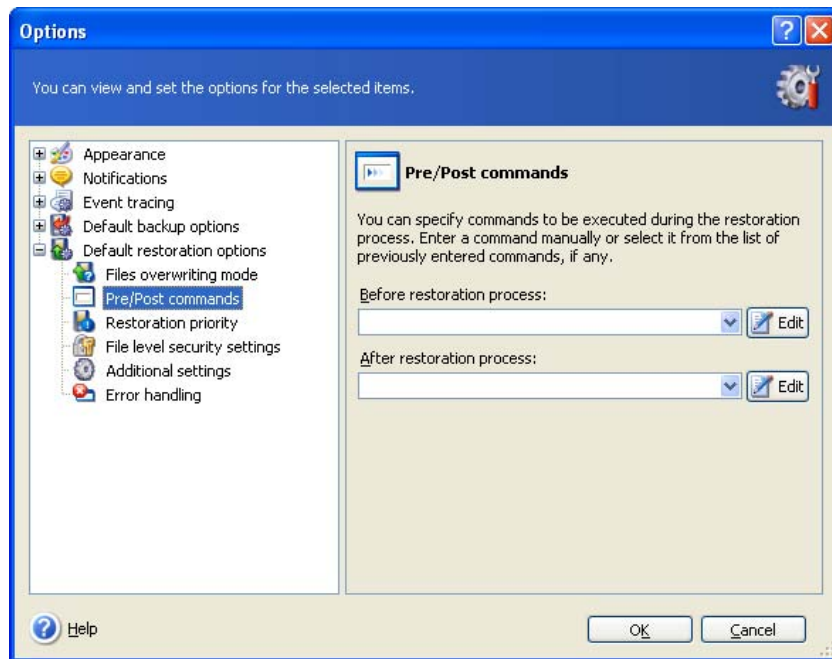
Overwrite existing file – this will give the archived file unconditional priority over the file on the hard disk.

Overwrite existing file if it is older – this will give the priority to the most recent file modification, whether it be in the archive or on the disk.

Do not overwrite existing file – this will give the file on the hard disk unconditional priority over the archived file.

6.4.2 Pre/post commands

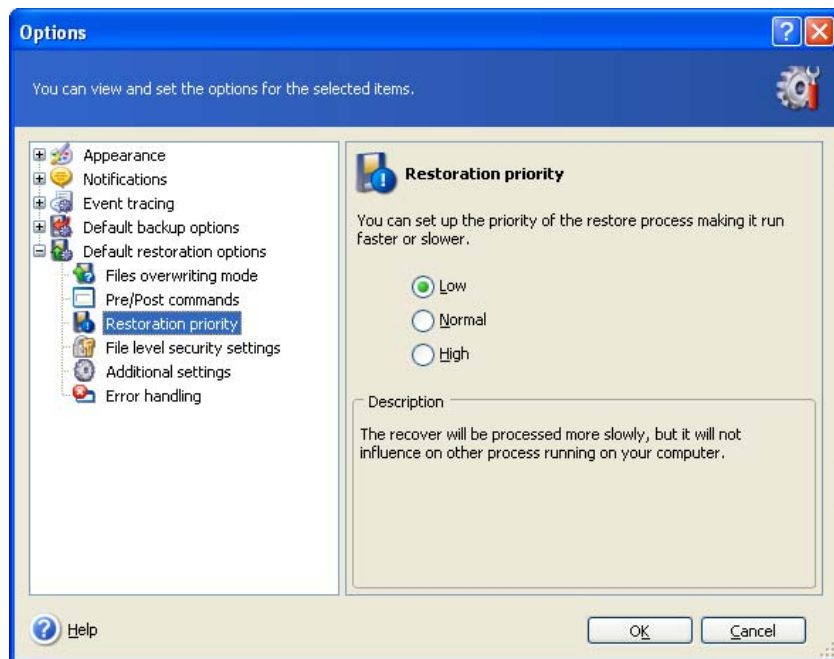
You can specify commands or batch files to be automatically executed before and after the restore procedure. Click **Edit** to open the **Edit Command** window where you can easily input the command, its arguments and working directory or browse folders to find a batch file.



The program does not support interactive commands, i.e. commands that require user input (for example, "pause".)

6.4.3 Restoration priority

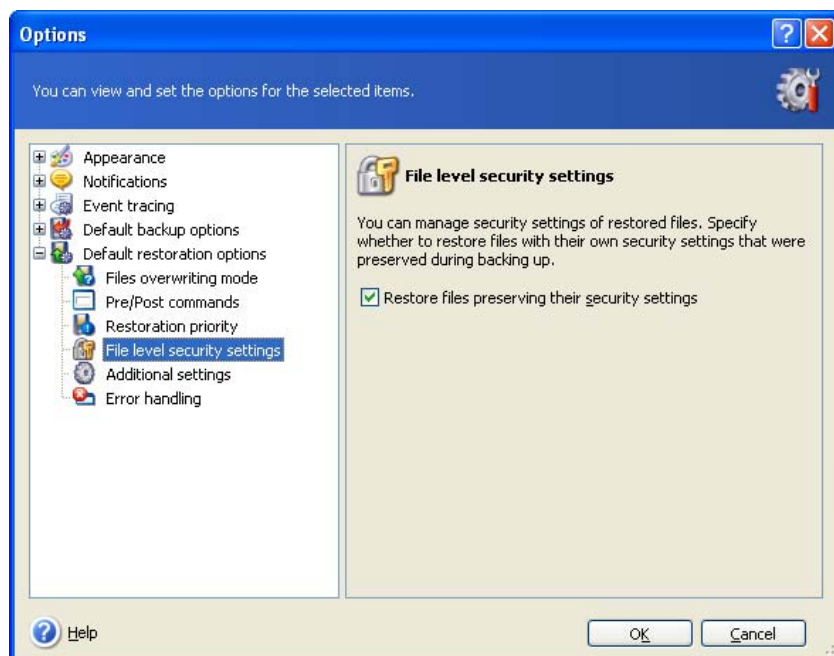
The default setting – **Low**.



The priority of any process running in a system determines the amount of CPU usage and system resources allocated to that process. Decreasing the restoration priority will free more resources for other CPU tasks. Increasing of restoration priority may speed up the restore process due to taking resources from the other currently running processes. The effect will depend on total CPU usage and other factors.

6.4.4 File-level security settings

The preset is **Restore files with their security settings**.



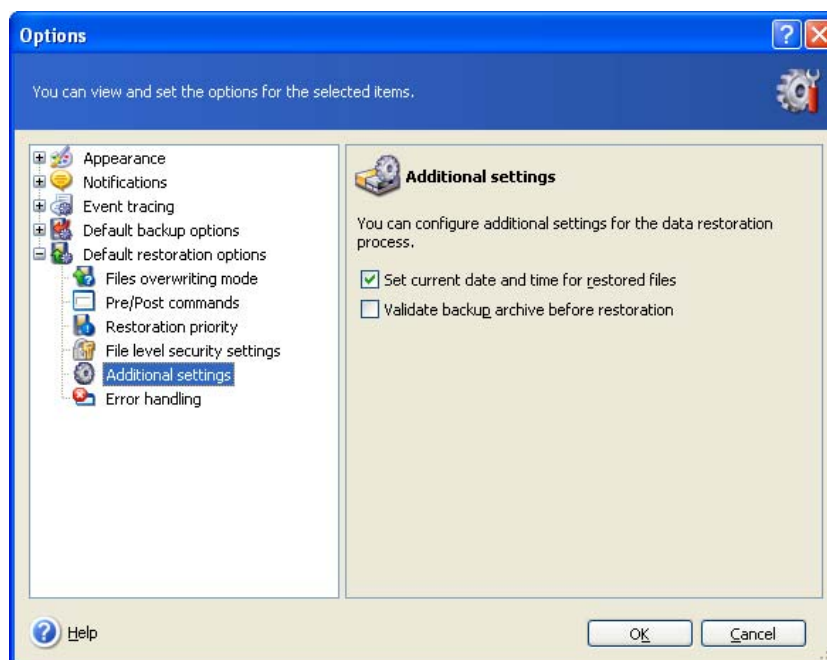
If the files' security settings were preserved during backup, you can choose whether to restore files' security settings or let the files inherit the security settings of the folder where they will be restored.

6.4.5 Additional settings

1. You can choose whether to restore files' date and time from the archive or assign the files the current date and time.
2. Before data is restored from the archive, SonicWALL Bare Metal Recovery can check its integrity. If you suspect that the archive might have been corrupted, select **Validate backup archive before restoration**.



To check archive data integrity you must have all incremental backups belonging to the archive and the initial full backup. If any of successive backups is missing, validation is not possible.



6.4.6 Error handling

1. Do not show messages and dialogs while processing ("silent" mode)

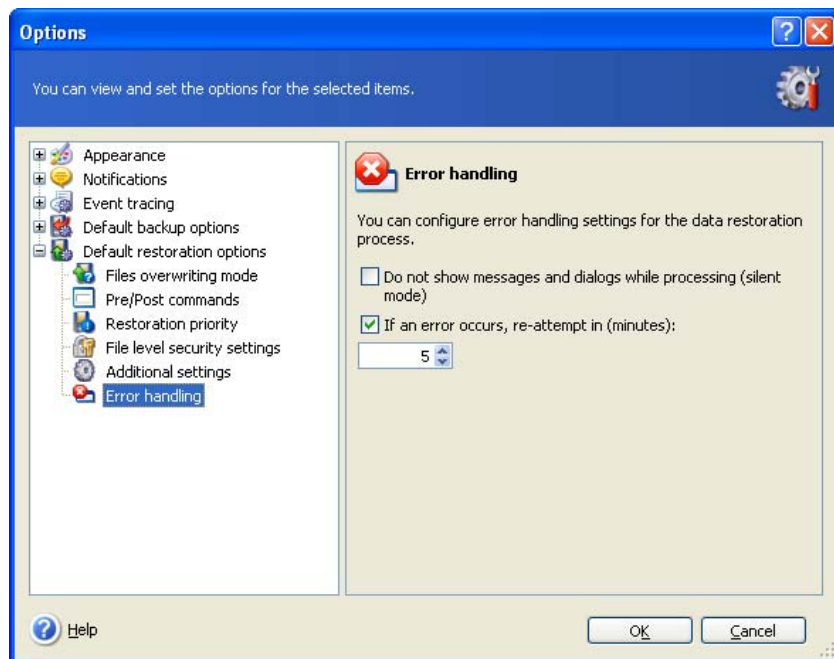
The preset is **disabled**.

With the silent mode enabled, the program will not display interactive windows. Instead, it will automatically handle situations requiring user intervention. No prompts will be displayed, including those for inserting removable media. If an operation cannot continue without user action, it will fail. Details of the operation, including errors, if any, could be found in the operation log.

2. If an error occurs, re-attempt in (minutes)

The preset is **enabled**.

When the backup location on the network is not available or not reachable, the program will attempt to reach the location at the specified time interval.



6.5 Creating dynamic disks and volumes

SonicWALL Bare Metal Recovery Universal Enterprise Server must obtain **exclusive access** to the disks to perform operations with disks and volumes. This means no other applications can access it at that time. Please close all other applications that use the disks (such as Windows Disk Management) before starting the disk conversion and dynamic volume creation wizards.

6.5.1 Creating dynamic volumes

This operation is available only in SonicWALL Bare Metal Recovery Universal Enterprise Server, including bootable version of this component. Having booted to the SonicWALL environment, you can easily prepare the desired dynamic group on bare metal or a computer with a non-Windows operating system.

The operation supports both dynamic disks and MBR or GPT basic disks. Basic disks will be converted to dynamic.



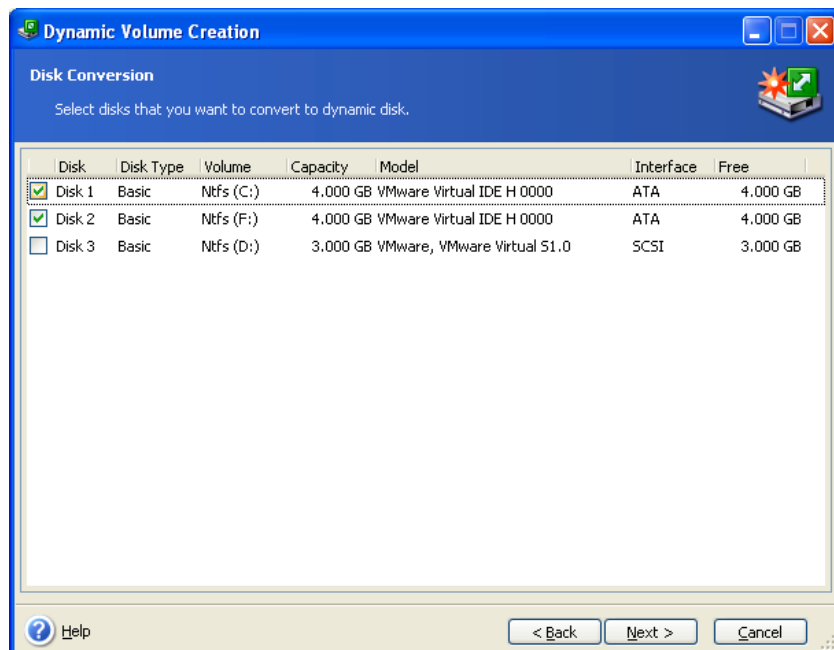
All data contained on the basic disk and the basic disk partitioning will be lost. On dynamic disks, only unallocated space will be used for the new volume.

An MBR basic disk must have at least 1MB of free space at the end of the disk for the dynamic disk database.

To create a dynamic volume:

1. Close all applications that use the disk(s) on which the volume is to be created.
2. Start the Dynamic Volume Creation Wizard by selecting **Tools -> Dynamic Volume Creation Wizard** in the main program menu.
3. Select basic, dynamic or newly connected disks on which the dynamic volume will be created. Dynamic disks are selected by default. You can deselect any, if need be, later in the wizard.

If you tick off disks other than dynamic, these will be converted to dynamic disks and included in the dynamic group. However, this will be done when the operation starts. While you are using the wizard, no changes are made to disks.



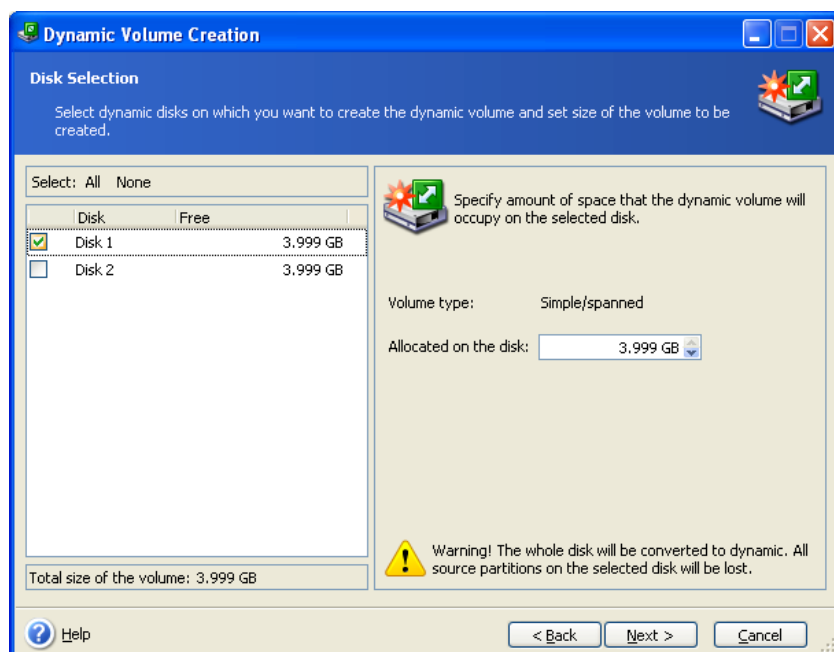
4. Select the type of dynamic volume that will be created: simple/spanned, striped, mirrored or RAID 5.

5. Specify amount of space that the dynamic volume will occupy on each of the selected disks. The value you set is adjusted to the selected volume type.

For a spanned volume, amount of space on each disk is selected independently. If only one disk is selected, a simple volume is created.

Striped, mirrored and RAID 5 volumes imply even distribution of data between disks. Therefore, the volume must occupy the same space on each disk. If you set different values, your latest setting will be applied to all the disks. If the set value is more than unallocated space on any disk, the minimal available space amount will be applied to all the disks. The resulting volume size is displayed under the disk selection field.

At this step, you can deselect disks that you do not want to be included in the volume.



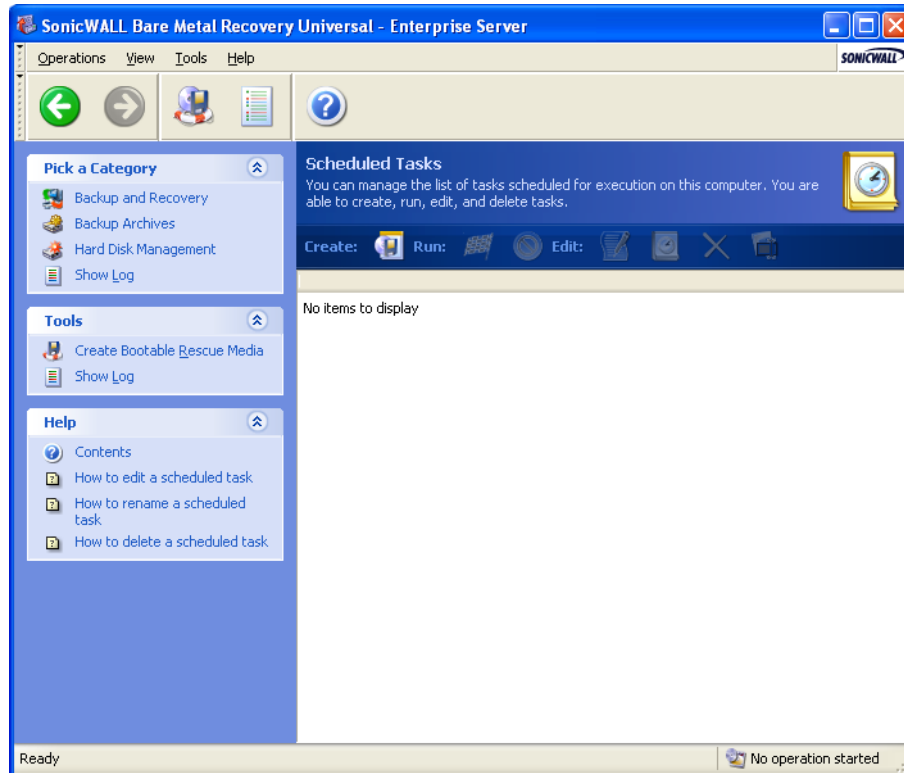
6. Click **Proceed** in the summary window.

On completion of operations, the dynamic volumes are unformatted and have no letters assigned. You will be able to assign the letters using Windows Disk Management tool after restoring Windows on the created volumes.

Chapter 7. Scheduling tasks

SonicWALL Bare Metal Recovery Universal Enterprise Server allows you to schedule periodic backup and archive validation tasks. Doing so will give you peace of mind, knowing that your data are safe.

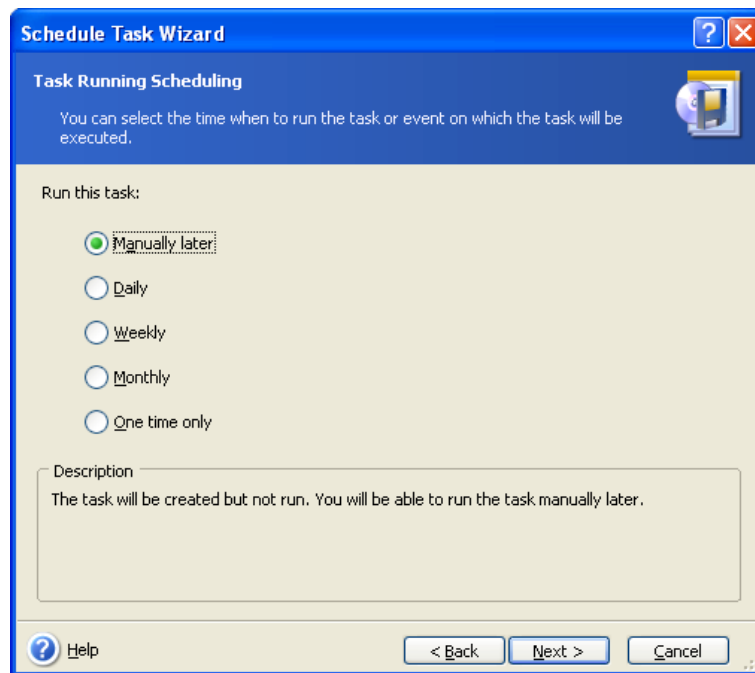
You can create more than one independently scheduled task. For example, you can back up your current project daily and back up the application disk once a week.



All the scheduled tasks appear in the **Scheduled Tasks** window, where you can start, stop, edit, delete and rename them. To navigate to the **Scheduled Tasks** window, click **Tasks** in the **Manage Tasks** group or select the **Task Scheduling** category on the sidebar.

7.1 Creating scheduled tasks

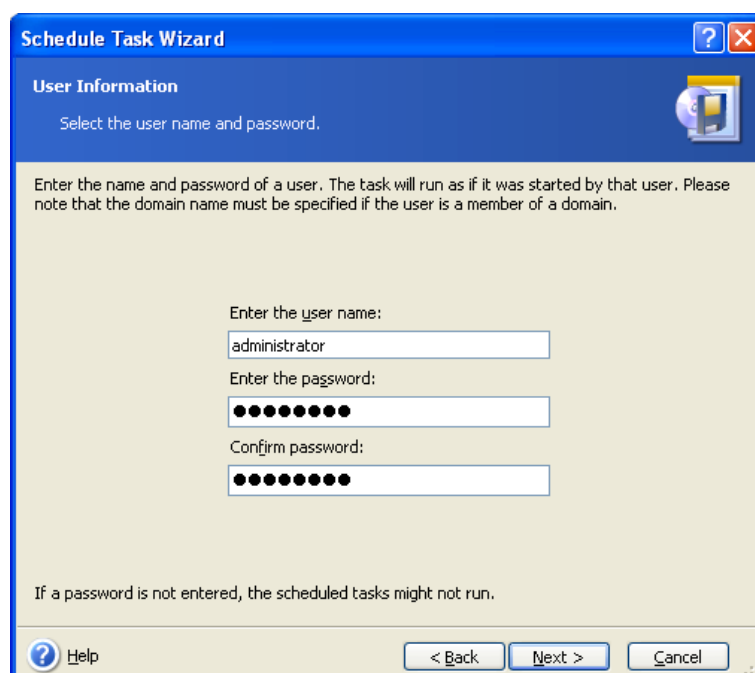
1. To start the **Schedule Task Wizard**, click **Create** on the **Scheduled Tasks** window toolbar or select **Operations -> Schedule Task** from the main menu.
2. Choose the **Backup** or **Validate** operation. If the latter is the case, choose the archive in the next window and you will be taken straight to step 4.
3. If backup is your choice, configure a backup task in the usual way (see [Chapter 5. Creating backup archives](#)). If you choose to create the backup archive on a network drive, enter a user name and a password for the drive access.
4. Set the task execution periodicity.



- **Manually later** – the task will be saved, but not launched automatically. You will be able to launch it later by clicking **Run** in the **Scheduled Tasks** window
- **Daily** – the task will be executed once a day or once in several days
- **Weekly** – the task will be executed once a week or once in several weeks on the selected day
- **Monthly** – the task will be executed once a month on the selected day
- **One time only** – the task will be executed once at the specified time and day

5. Specify the task start time and other schedule parameters, according to the selected periodicity (see 7.1.1 - 7.1.4).

6. Next you will have to specify the name of the user who owns the executed task; otherwise no scheduled execution will be available.



In the upper field, enter a user name. Enter a password twice in two fields below.

7. At the final step, the task configuration is displayed. Up to this point, you can click **Back** to make changes in the created task. If you click **Cancel**, all settings will be lost. Click **Finish** to save the task.

8. The task schedule and default name appear in the **Scheduled Tasks** window. You can rename the task, if need be.

7.1.1 Setting up daily execution

If you select daily execution, set the **Start time** and days on which you want to execute the task:

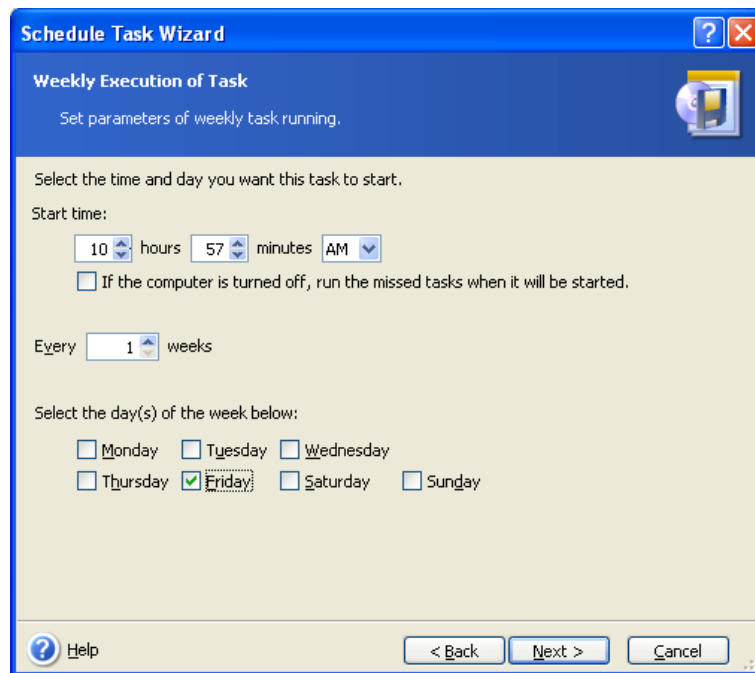
- Every day
- Weekdays
- **Every x days** – once in several days (specify the interval).

The screenshot shows the 'Schedule Task Wizard' dialog box, specifically the 'Daily Execution of Task' step. The title bar reads 'Schedule Task Wizard'. Below the title bar, the text 'Daily Execution of Task' is displayed, followed by the instruction 'Set parameters of daily task running.' The main area contains the following elements: a label 'Select the time and day you want this task to start.'; a 'Start time:' section with spinners for '10' hours and '57' minutes, and a dropdown for 'AM'; a checkbox labeled 'If the computer is turned off, run the missed tasks when it will be started.'; another 'Start time:' section with three radio buttons: 'Every day' (selected), 'Weekdays', and 'Every' followed by a spinner set to '2' days; and a checkbox labeled 'Repeat task every' followed by a spinner set to '2' hours, 'until' a spinner set to '10' hours, '57' minutes, and 'AM'. At the bottom, there is a 'Help' button with a question mark icon, and three buttons: '< Back', 'Next >', and 'Cancel'.

If the computer is off when the scheduled time comes, the task won't be performed, but you can force the missed task to launch at the next system startup by checking a box under the **Start time** fields.

7.1.2 Setting up weekly execution

If you select weekly execution, set the **Start time**, specify the task execution periodicity in the **Every x weeks** box (every week, every two weeks, etc.) and check the days on which to execute the task.

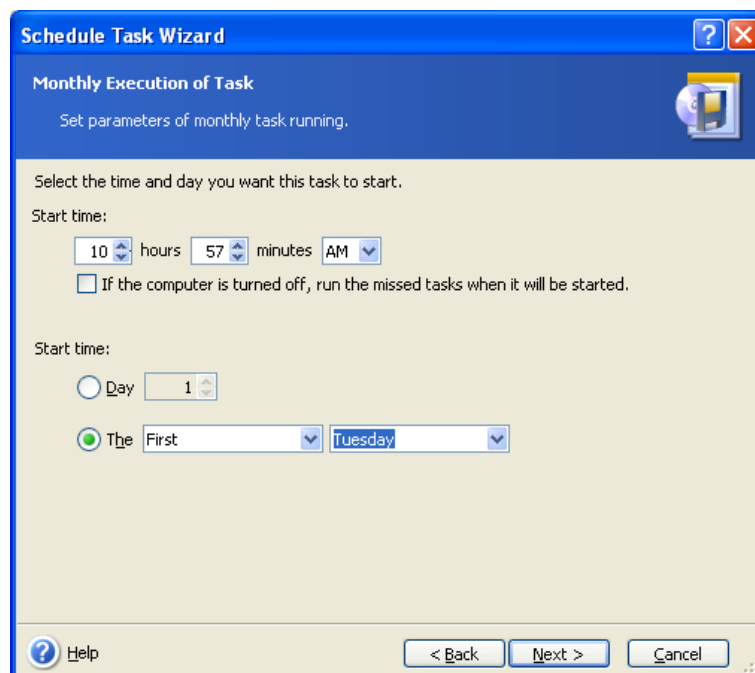


If the computer is off when the scheduled time comes, the task won't be performed, but you can force the missed task to launch at the next system startup by checking a box under the **Start time** fields.

7.1.3 Setting up monthly execution

If you select monthly execution, set the **Start time** and days on which to execute the task:

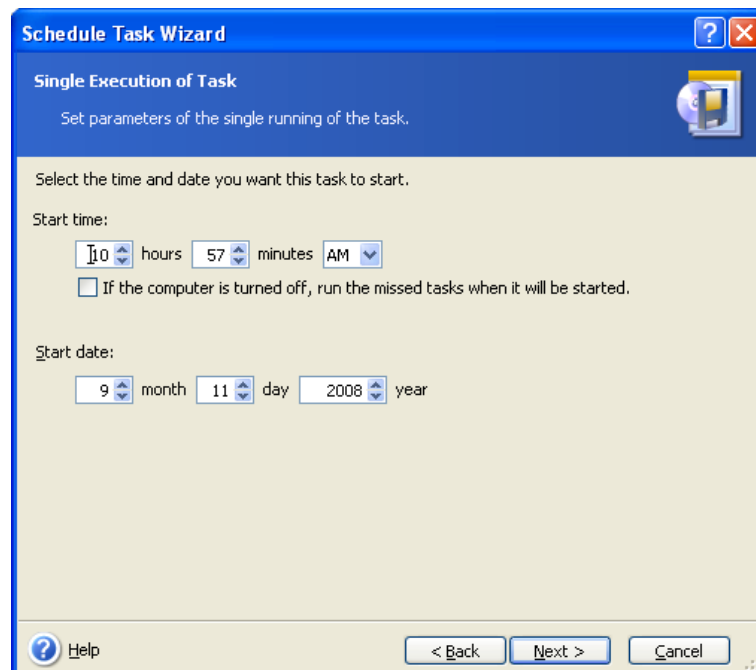
- **Day** – on the specified date
- **The <specify a day>** – on the specified day (e.g. on first Tuesday or fourth Friday); select this from the drop-down lists.



If the computer is off when the scheduled time comes, the task won't be performed, but you can force the missed task to launch at the next system startup by checking a box under the **Start time** fields.

7.1.4 Setting up one-time execution

If you select the one-time execution, set the **Start time** and date on which to execute the task:



If the computer is off when the scheduled time comes, the task won't be performed, but you can force the missed task to launch at the next system startup by checking a box under the **Start time** fields.

7.2 Managing scheduled tasks

The task Status, Schedule, Last Run Time and Last Result are shown in the **Scheduled Tasks** window. To view the other task details, right-click on its name.

There are two ways of changing the task parameters. Editing allows you to change any task parameters. This is performed in the same way as creation, however, the earlier selected options will be set, so you have to enter only the changes. To edit a task, select it and click **Edit** on the toolbar.

If you want to change only the task start trigger (time or event), click **Schedule** on the toolbar. Then you will have to perform only scheduling steps, leaving other settings the same.

To delete a task with confirmation, select it and click **Delete** on the toolbar.

To rename a task, select it, click **Rename** on the toolbar, enter the new task name and press Enter.

Chapter 8. Creating bootable media

You can run SonicWALL Bare Metal Recovery on a bare metal or on a crashed computer that cannot boot. You can also back up disks on a non-Windows computer, copying all its data sector-by-sector into the backup archive. To do so, you will need bootable media with the standalone SonicWALL Bare Metal Recovery version.

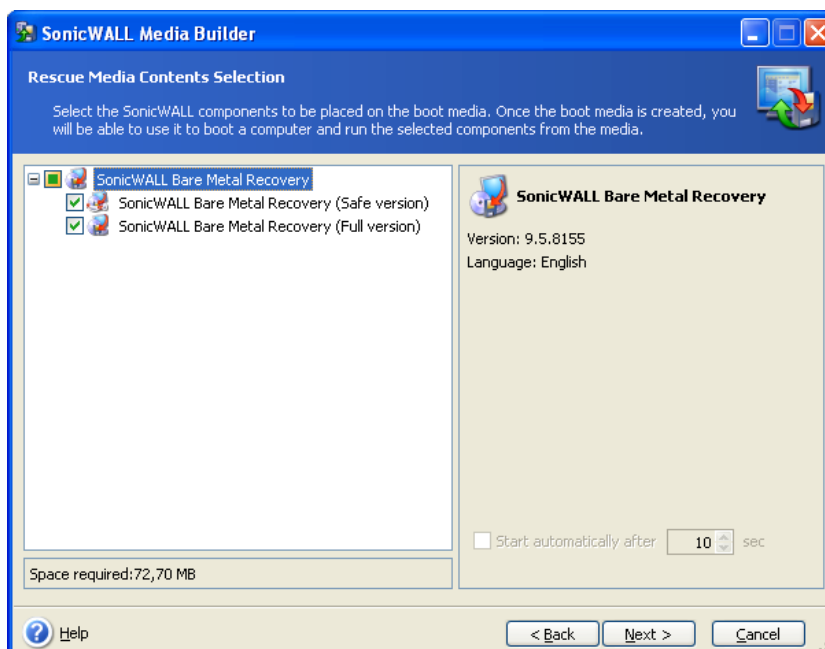
Because SonicWALL Bare Metal Recovery is available only as a download, you must create bootable media using the Bootable Media Builder. For this, you will need a blank CD-R/RW, DVD±R/RW, several formatted diskettes (the wizard will tell you the exact number), or any other media your server can boot from, such as a Zip drive.

SonicWALL Bare Metal Recovery also has the ability to create an ISO image of a bootable disk on the hard disk. If there is a Microsoft RIS server in your local network, an IT administrator can save the bootable data on this server as well. Then any networked computer will be able to boot SonicWALL Bare Metal Recovery from the RIS package.

If you have other SonicWALL products you can include standalone versions of these programs on the same bootable disk as well.

1. Click **Create Bootable Rescue Media** on the toolbar or the sidebar, or select **Create Bootable Rescue Media** from the **Tools** menu. You can also run the Bootable Rescue Media Builder without loading SonicWALL Bare Metal Recovery by selecting **Programs -> SonicWALL -> SonicWALL Bare Metal Recovery -> Bootable Rescue Media Builder** from the **Start** menu.

2. Select which components of SonicWALL programs you want to place on the bootable media.



SonicWALL Bare Metal Recovery offers the following components:

- SonicWALL Bare Metal Recovery full version

Includes support of USB, PC Card and SCSI interfaces along with the storage devices connected via them, and therefore is highly recommended.

- SonicWALL Bare Metal Recovery safe version

Does not include USB, PC Card, or SCSI drivers. Recommended for use in case of problems with running Full version

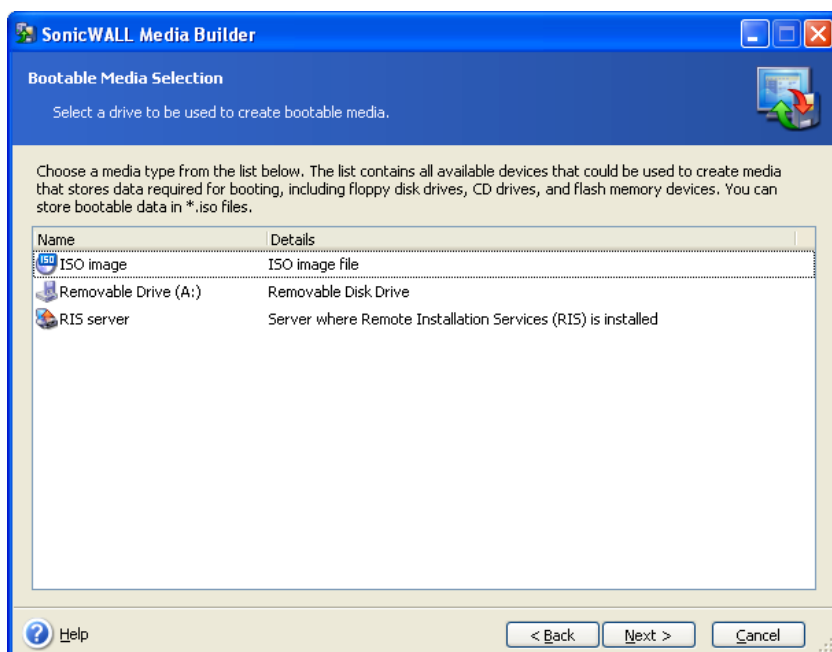
To find more about components of other SonicWALL products, see the respective user guides.

The **Start automatically after** parameter specifies the timeout interval for the boot menu. If this parameter is not specified, at booting a computer the program will display the boot menu and wait for someone to select whether to boot the OS or the SonicWALL component. If you set 10 sec for SonicWALL Bare Metal Recovery, for example, it will start launching it in 10 seconds after the menu is displayed. This enables fully remote operations if you are booting from a RIS server.

3. Select the type of bootable media (CD-R/RW, DVD±R/RW or 3.5" diskettes) to create. If your BIOS has this feature, you can create other bootable media such as removable USB flash drives. You can also choose to create a bootable disk ISO image or save bootable data on the RIS server.



When using 3.5" diskettes, you will be able to write on a diskette (or a set of the diskettes) only one component at a time — for example, SonicWALL Bare Metal Recovery. To write another component, start the Bootable Media Builder once again.



4. If you are creating a CD, DVD, diskettes or any removable media, insert the blank disk so the program can determine its capacity. If you chose to create a bootable disk ISO image, specify the ISO file name and the folder in which to place it. If you chose to save bootable data on a RIS server, specify the server and provide the user name and password to access it.

5. Next, the program will calculate how many blank disks are required (in case you have not chosen ISO or RIS) and give you time to prepare them. When you are finished, click **Proceed**.

After you create a boot disk, mark it and keep it in a safe place.

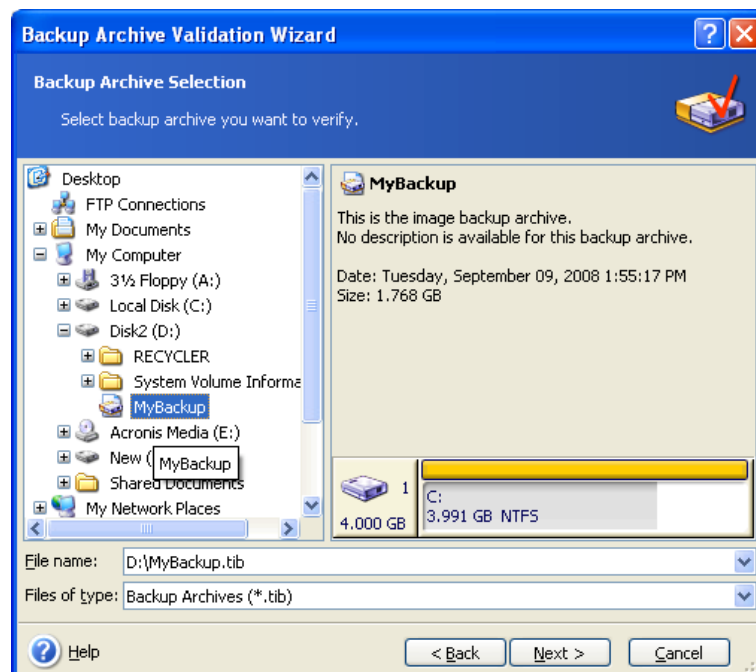
Chapter 9. Operations with archives

9.1 Validating backup archives

You can check the integrity of an archive to be certain that the archive is not damaged. Here's how to run a one-time validation task. For how to schedule regular archive validation, see [7.1 Creating scheduled tasks](#).

1. To start the **Backup Archive Validation Wizard**, select **Validate Backup Archive** in the **Explore and Validate Archives** tools group or in the **Tools** group or click **Validate Backup Archive** on the toolbar.

2. Select the archive to validate.



3. Click **Proceed** to launch the validation procedure. After the validation is complete, you will see the results window. You can cancel checking by clicking **Cancel**.



You must have all incremental backups belonging to the archive and the initial full backup to check archive data integrity. If any successive backups are missing, validation is not possible.

9.2 Exploring archives and mounting images

SonicWALL Bare Metal Recovery offers two kinds of archive contents management: mounting for images and exploring for both images and file-level archives.

Archives located on an FTP server cannot be explored or mounted.

Both operations are performed through the **Backup Archives** category.

Exploring images and file-level archives lets you view their contents and copy the selected files to the hard disk.

Mounting images as virtual drives lets you access them as though they were physical drives. This means that:

- a new disk with its own letter will appear in the drives list

- using Windows Explorer and other file managers, you can view the image contents as if they were located on a physical disk or partition
- you will be able to use the virtual disk in the same way as the real one: open, save, copy, move, create, delete files or folders. If necessary, the image can be mounted in read-only mode

Please keep in mind that although both file archives and disk/partition images have a default “.tib” extension, only **images** can be mounted. If you want to view file archive contents, use the Explore operation. The following is a brief summary of the Explore and Mount operations:

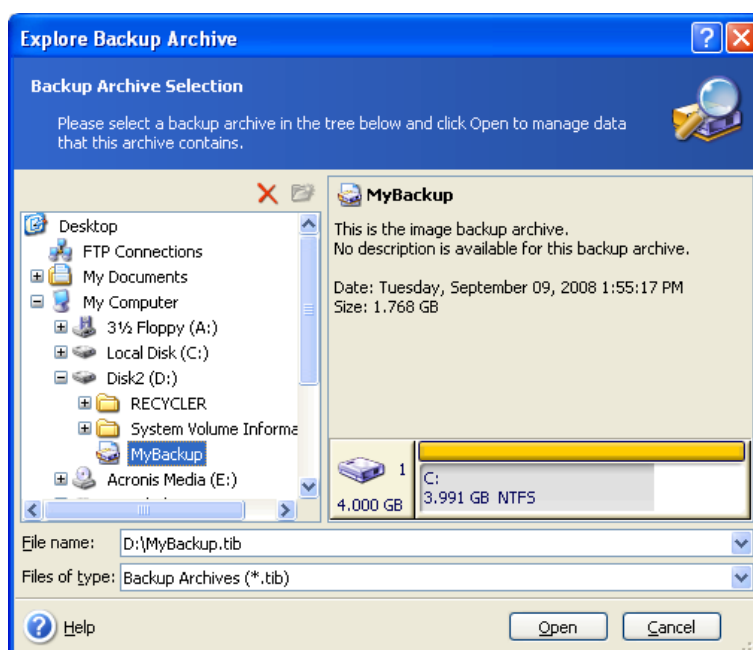
	Explore	Mount
Archive type	File-level, disk or partition image	Partition image
Assigning a letter	No	Yes
Archive modification	No	Yes (in R/W mode)
Files extraction	Yes	Yes



SonicWALL Bare Metal Recovery can mount or explore an image archive only if all its volumes reside in the same directory. If your archive spans several CD-R/RW discs and you want to mount the image, copy all volumes to a hard disk drive or network drive.

9.2.1 Exploring an archive

1. Click **Explore and Validate Backup Archives** in the **Tools** group or select the **Backup Archives** category on the sidebar to navigate to the Manage Backup Archives window. Then select **Explore Backup Archive**. Or, you can select **Tools -> Explore Backup Archive** in the main program menu.
2. Select an archive from the drive tree and click **Open**.



If you added a comment to the archive, it will be displayed to the right of the drives tree. If the archive was protected with a password, SonicWALL Bare Metal Recovery will ask for it. Further steps will not be enabled until you enter the correct password.

3. The program opens a Windows Explorer window displaying the archive contents. If you selected an archive containing incremental backups, SonicWALL Bare Metal Recovery will suggest that you select one of the successive backups by its creation date/time. This allows you to explore the data state for a given point in time.



To explore an incremental backup, you must have all previous incremental backups and the initial full backup. If any successive backups are missing, exploring is not possible.

Double-click the backup icon to view the data saved in the backup. You can copy and paste or drag-and-drop any file or folder from the backup being explored to any hard disk folder.

9.2.2 Mounting an image

1. Start the **Mount Image Wizard** by selecting **Operations -> Mount Image** in the main program menu.
2. Select the archive from the drives tree.



If you added a comment to the archive, it will be displayed to the right of the drives tree. If the archive was protected with a password, SonicWALL Bare Metal Recovery will ask for it. Neither the partitions layout, nor the **Next** button will be enabled until you enter the correct password.

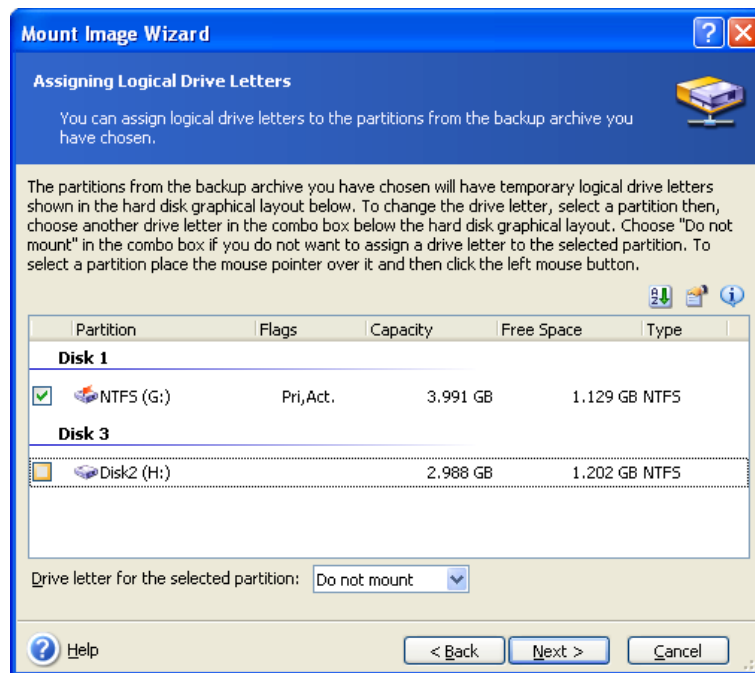
3. If you selected an archive containing incremental images, SonicWALL Bare Metal Recovery will suggest that you select one of the successive incremental images by its creation date/time. This allows you to explore the partition state for a given point in time.



To mount an incremental image, you must have all previous incremental images and the initial full image. If any of the successive images are missing, mounting is not possible.

4. Select a partition to mount. (Note that you cannot mount the entire disk.)

You can also select a letter to be assigned to the virtual drive from the **Drive letter** drop-down list. If you do not want to assign a letter to the virtual drive, select **Do not assign**.



5. Select whether you want to mount image in **Read-only** or **Read/Write** mode.
6. If you select **Read/Write** mode, the program assumes that the connected image will be modified, and creates an incremental archive file to capture the changes. It is strongly recommended that you list the forthcoming changes in the comment to this file.
7. The program displays a summary containing a single operation. Click **Proceed** to connect the selected partition image as a virtual disk.
8. After the image is connected, the program will run Windows Explorer, showing its contents. Now you can operate with files or folders as if they were located on a physical disk.

You can connect multiple partition images. If you want to connect another partition image, repeat the procedure.

9.2.3 Unmounting an image

We recommend that you unmount the virtual disk after all necessary operations are finished, as keeping up virtual disks takes considerable system resources. If you do not, the virtual disk will disappear after your server is turned off.

To disconnect the virtual disk, click **Unmount Image** and select the disk to unmount. You can also unmount the disk in Windows Explorer by right-clicking on its icon and selecting **Unmount**.

9.3 Converting disk images to virtual disks

To convert a disk image to a virtual disk file:

1. Select **Tools -> Convert Backup to Virtual Disk** in the main program menu.
2. Select the disk image to convert.
3. If there are several disks in the image, select one to convert.
4. Choose a type of the disk to be created.
5. Specify the path to the file to be created.

Since the disk space is not pre-allocated, the physical disk on which the virtual disk will run is expected to have sufficient space for the virtual disk to grow.

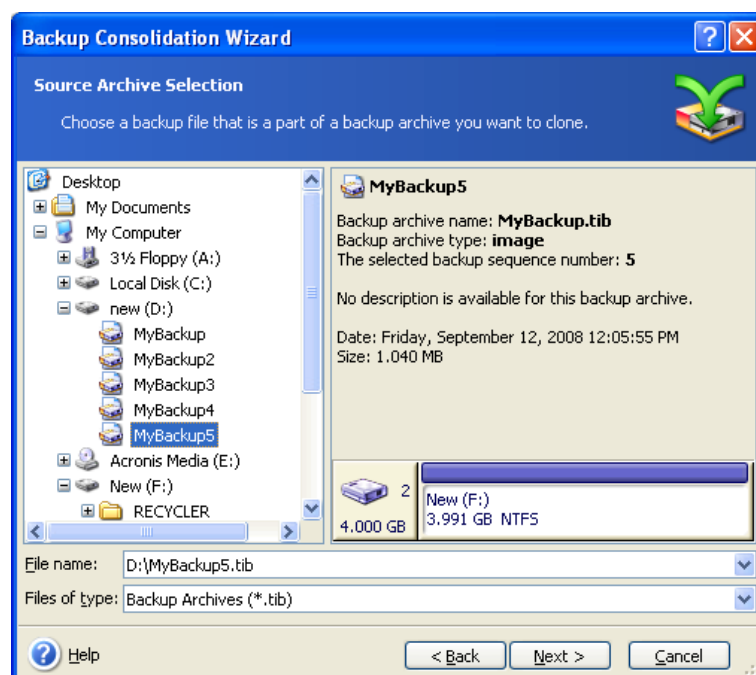
6. Click **Proceed** in the summary window.

9.4 Consolidating backups

The file name-based consolidation allows deleting the backups that you do not need any more from any archive while keeping the archive consistency. In either case, you can delete from an archive, if need be, the base full backup. The program will create another full backup in place of the oldest remaining backup. The difference is as follows:

To consolidate backups in the archive:

1. Start the **Backup Consolidation Wizard** by selecting **Tools -> Consolidate archive** in the main program menu.
2. Select the archive from the drives tree.

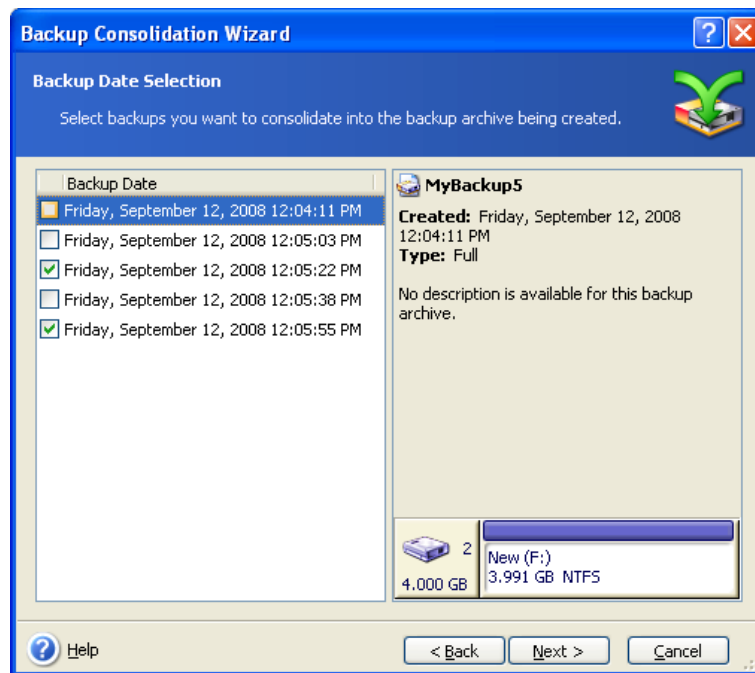


An archive MyBackup consisting of one full (MyBackup) and four incremental backups (MyBackup2-5) is selected

3. The program displays a list of backups belonging to the selected archive with the backup creation date and time. The list is similar to that in the restore wizard. The upper backup is the full backup; the rest are incremental backups. Select the backups you want to *keep*.

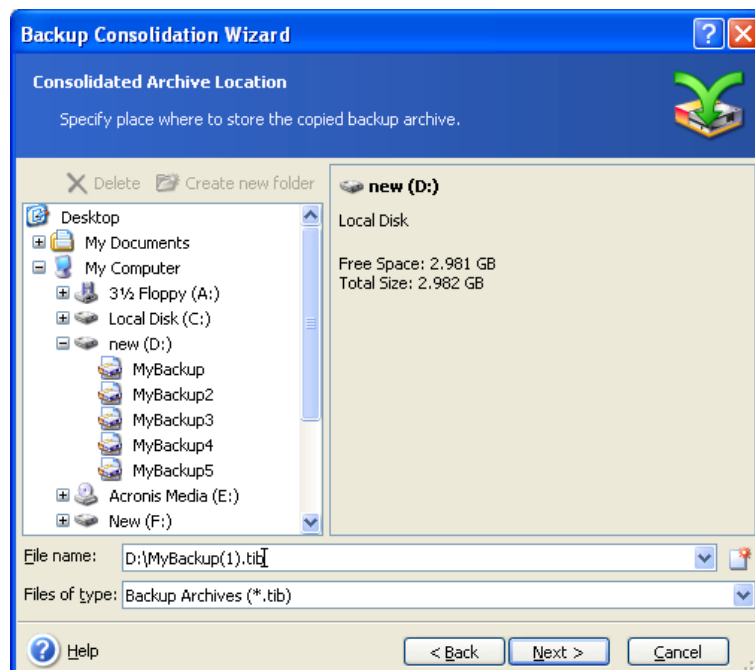


Editing images, mounted in R/W mode, results in creating incremental backups that are a kind of offshoots of the incremental chain. Therefore, they cannot be consolidated and always will be excluded from the archive copy.



The clone archive will consist of MyBackup3 and MyBackup5, however, their numbers will be zero (no number) and 2. MyBackup3 will change into a full backup

4. Choose location and name for the archive copy. By default, the program suggests the same location and the source archive name with (1) added.



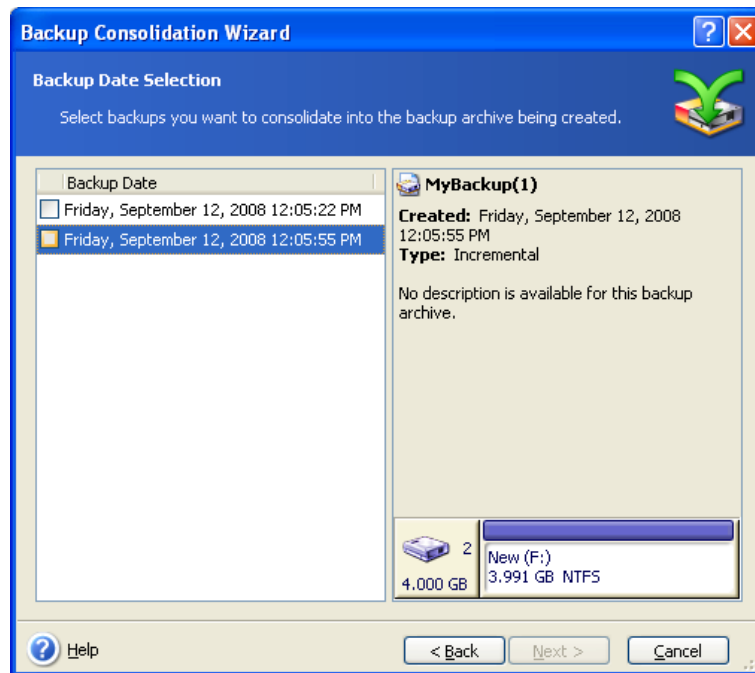
New archive will be created in the same folder and named MyBackup(1)

5. The program displays the summary window. Click **Proceed** to start consolidation.

In our example, when consolidation is completed, the folder Backups will contain two archives MyBackup and MyBackup(1). The first is the source archive, the second is the copy consisting of MyBackup(1) and MyBackup(1)2.

MyBackup(1) is a full backup containing data as of Friday, September 12, 2008, 12:05:22 PM. MyBackup(1)2 is an incremental backup containing data as of Friday, September 12,

2008, 12:05:55 PM. You can make sure of this by starting the consolidation wizard again, selecting the archive MyBackup(1) and proceeding to the next window.



The resulting archive contents

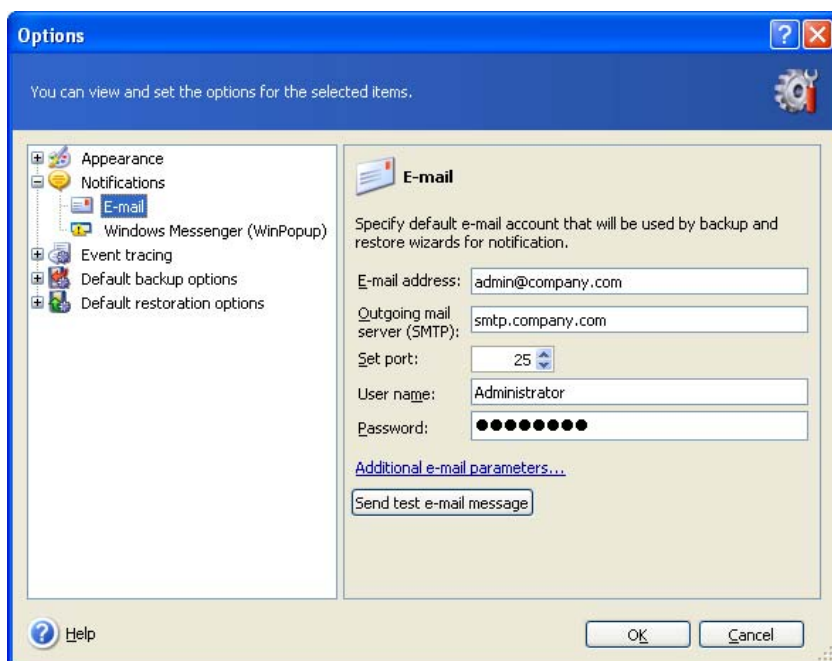
Chapter 10. Notifications and event tracing

Sometimes a backup or restore procedure can last for 30 minutes or more. SonicWALL Bare Metal Recovery can notify you when it is finished through the WinPopup service or e-mail. The program can also duplicate messages issued during the operation or send you the full operation log after operation completion.

By default all notifications are **disabled**.

10.1 Email notification

To set up e-mail notification, select **Tools -> Options -> Notifications -> E-mail**:



Provide the e-mail address to which notifications will be sent. You can enter several addresses separated by semicolons.

Provide the outgoing SMTP server name. A user name and a password might also be needed if the SMTP server requires authentication.

Some Internet service providers require authentication on the incoming mail server before being allowed to send anything. If this is your case, click **Advanced** and tick off **Log on to incoming mail server** and provide the server name.

Filling up the **From** and **Subject** fields will help the e-mail client program filter notifications to the appropriate folder. If the From field is left blank, messages will be constructed as if they are from the destination address.

Below, in this window, you can choose whether you want to get notifications:

- when the operation is completed successfully (check **Add full log to the notification** to add the full operation log to the message)
- when the operation failed (check **Add full log to the notification** to add the full operation log to the message)
- during the operation when user interaction is required.

10.2 WinPopup notification

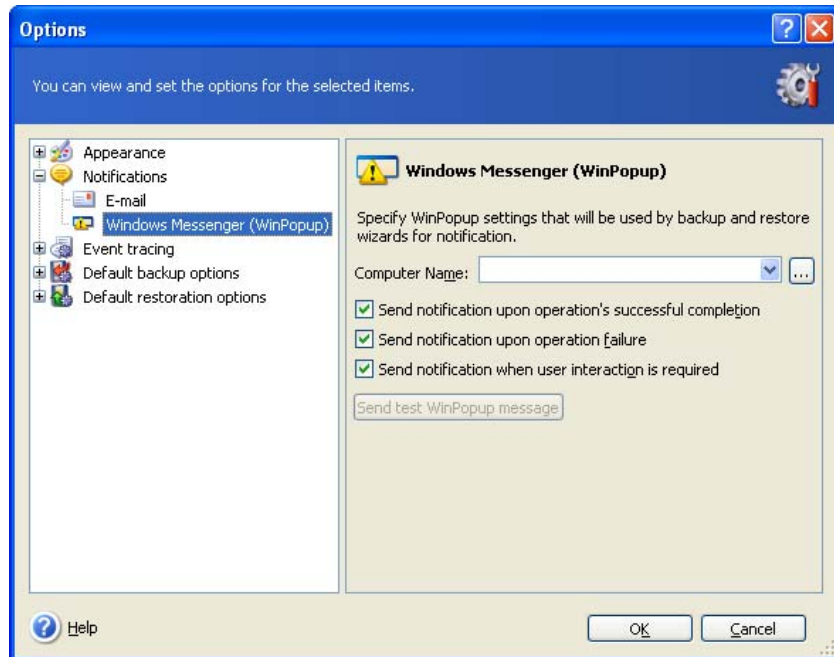
To set up WinPopup notification:

1. Enable the Messenger service on both the computer executing the task and the computer that will receive messages.



The Messenger service is disabled by default in Windows Server 2003 family. Change the service **Startup mode** to **Automatic** and start the service.

2. Select **Tools -> Options -> Notifications -> Windows Messenger (WinPopup)**:



Provide the name of the computer to which notifications will be sent.

Below in this window you can choose whether you want to get notifications:

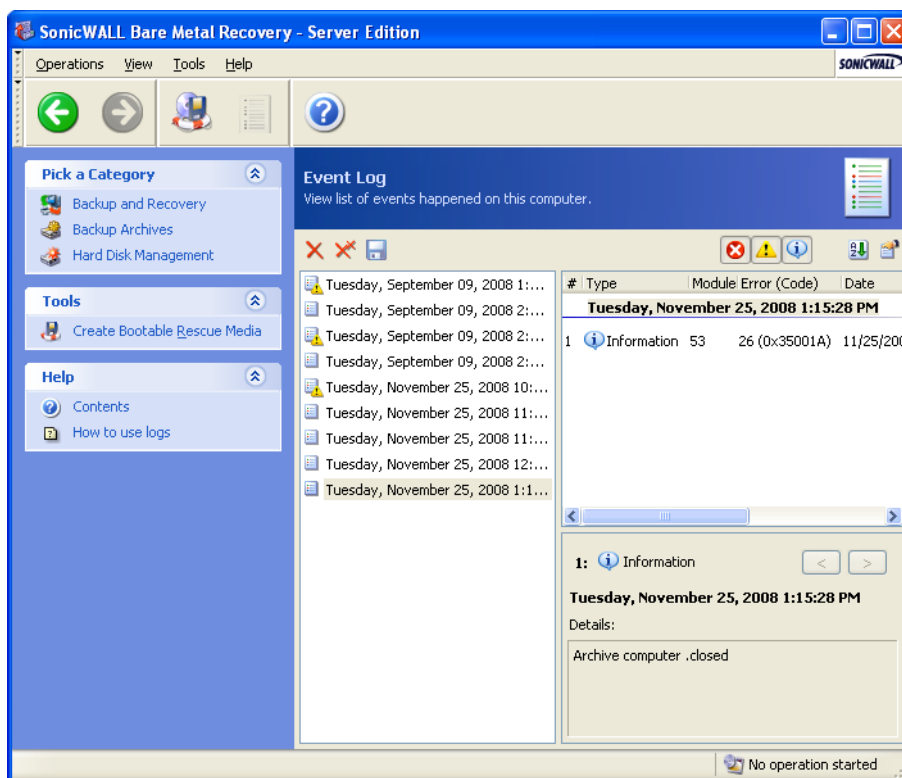
- when the operation is completed successfully
- when the operation failed
- during the operation when user interaction is required.

10.3 Viewing logs

SonicWALL Bare Metal Recovery allows users to view its working logs. These logs can provide information about scheduled tasks results, including reasons for failure, if any.

To view the log window, select **Show log** on the toolbar or from the **Tools** menu.

The log browsing window contains two panes: the left one features the log list, while the right one shows selected log contents.



The left panel can contain up to 50 logs. If there are more, you can browse the list using the **More** and **Less** buttons with the left and right arrows.

To delete a log, select it and click **Delete**.

If any step was terminated by an error, the corresponding log will be marked with a red circle with a white "X" inside.

The right window features the list of steps contained in the selected log. The three buttons to the right control message filters: the white "X" in the red circle filters error messages, the exclamation sign in a yellow triangle filters warnings, and the "i" in the blue circle filters information messages.

To select columns (step parameters) to display, right-click the headers line or left-click the **Choose Details** button. Then check the desired parameters.

To sort messages by a particular parameter, click its header (click again to reverse order) or the **Arrange Icons by** button (the second from the right) and select the desired parameter.

You can also change column width by dragging the borders with a mouse.

10.4 Event tracing

10.4.1 Windows event log

You can choose whether to store event log messages issued by SonicWALL Bare Metal Recovery to Windows Event Log (to see this log, run **eventvwr.exe** or select **Control Panel -> Administrative tools -> Event Viewer -> Application**).

The default setting – **Do not save messages**

To change this setting, select **Tools -> Options -> Windows event log**.

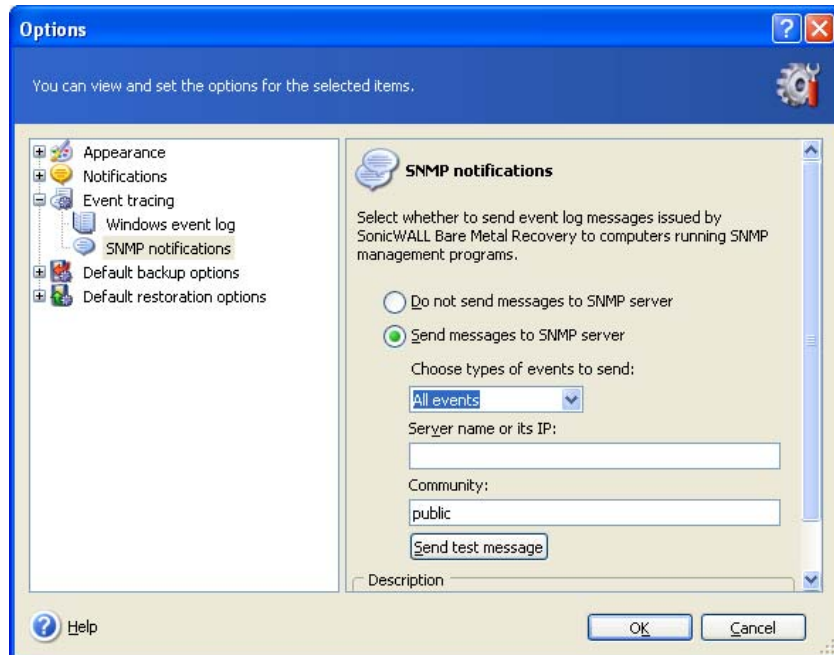
An additional choice is available - recording **All events, Warnings and Errors**, or **Errors only**.

10.4.2 SNMP notifications

SonicWALL Bare Metal Recovery can provide the following Simple Network Management Protocol (SNMP) objects to SNMP management applications:

1.3.6.1.4.1.24769.100.200.1.0 - string identifying a type of occurred event (Information, Warning, Error)

1.3.6.1.4.1.24769.100.200.2.0 - string containing text description of occurred event (it looks identically to messages published by SonicWALL Bare Metal Recovery in its log).



Sending SNMP messages is disabled by default. To set up sending messages, select **Send messages to SNMP server** and specify:

- types of events to be reported: All events, Warnings and Errors, or Errors only
- **Please note:** Depending on the reasons of the operation failure, sometimes the SNMP notification about this failure might not be sent to you, please, make sure to check the operation log.
- name or IP address of the host running the SNMP management application, to which notifications will be sent
- name of SNMP community to which both the host running SNMP management application and the computers executing the task belong.

Chapter 11. Transferring the system to a new disk

11.1 General information

Sooner or later computer users find that their hard disk is just too small. If you don't have space for more data, you can add another disk specifically for data storage.

For example, you might find that your hard disk does not have enough space for the operating system and installed applications, preventing you from updating your software. In this case, you have to transfer the system to a higher-capacity hard disk.

To transfer the system, you must first install the disk in the server. If a server doesn't have a bay for another hard disk, you can temporarily install it in place of your CD-ROM. If that is not possible, you can clone a hard disk by creating its image and restoring it to a new hard disk with larger partitions.

There are two transfer modes available: automatic and manual.

In the automatic mode, you will only have to take some simple actions to transfer all the data, including partitions, folders and files, to a newer disk, making it bootable if the original disk was bootable.

There will be only one difference between these disks – partitions on the newer disk will be larger. Everything else, including the installed operating systems, data, disk labels, settings, software and everything else on the disk, will remain the same.



This is the only result available in the automatic mode. The program can only duplicate the original disk layout to the new one. To obtain a different result, you will have to answer additional questions about cloning parameters.

The manual mode will provide additional data transfer flexibility.

1. You will be able to select the method of partition and data transfer:

- as is
- new disk space is proportionally distributed among the old disk partitions
- new disk space is distributed manually

2. You will also be able to select operations to perform on the old disk:

- leave partitions (and data) on the old disk
- remove all information from the old disk
- create new partitions on the old disk (and remove all the older information)



On program screens, damaged partitions are marked with a red circle and a white "X" inside in the upper left corner. Before you start cloning, you should check such disks for errors using the appropriate operating system tools.

11.2 Security

Please note the following: If the power goes out or you accidentally press **RESET** during the transfer, the procedure will be incomplete and you will have to partition and format or clone the hard disk again.

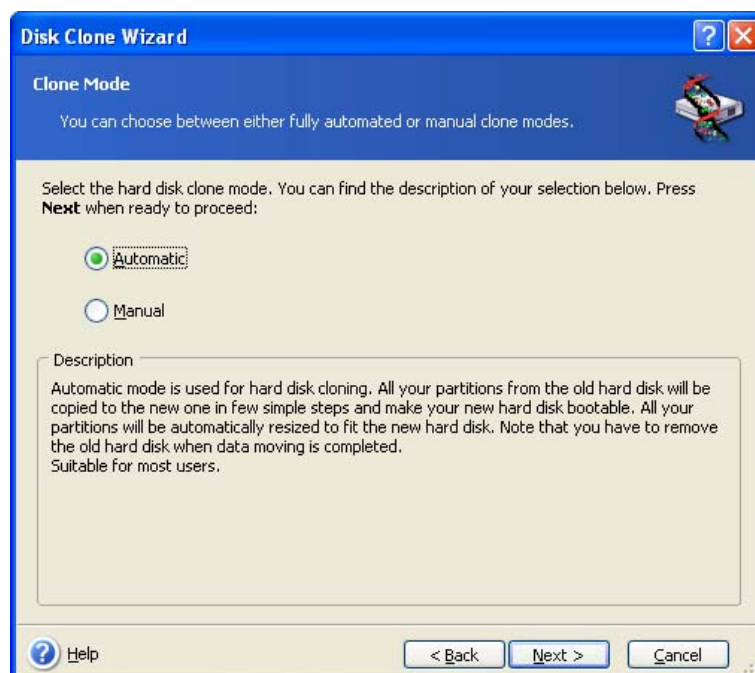
No data will be lost because the original disk is only being read (no partitions are changed or resized) until data transfer is completed.

We recommend that you do not delete data from the old disk until you are sure it is correctly transferred to the new disk, the server boots up from it and all applications work.

11.3 Executing transfers

11.3.1 Selecting Clone mode

You will see the **Clone mode** window just after the welcome window.

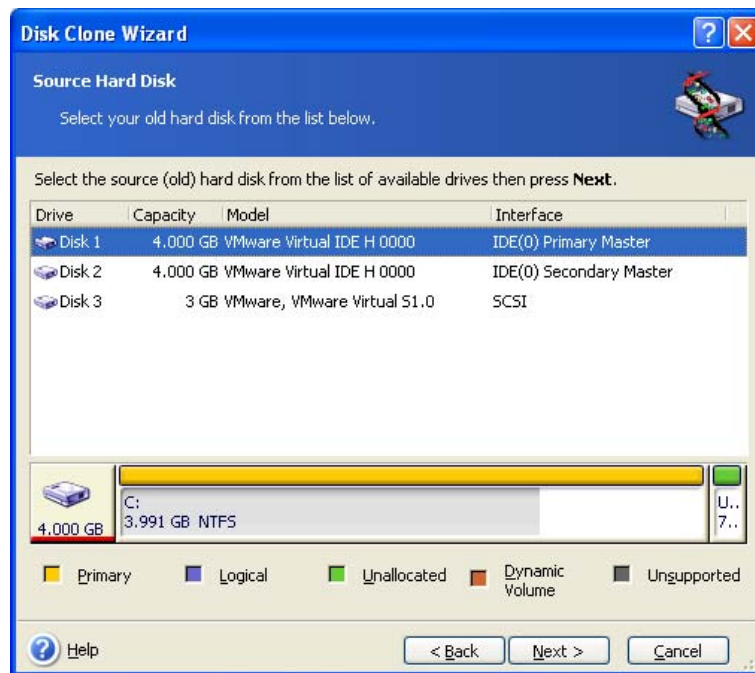


We recommend using automatic mode in most cases. The manual mode can be useful if you need to change the disk partition layout.

If the program finds two disks, one partitioned and another unpartitioned, it will automatically recognize the source disk as the partitioned disk and the destination disk as the unpartitioned disk, so the next two steps will be bypassed.

11.3.2 Selecting source disk

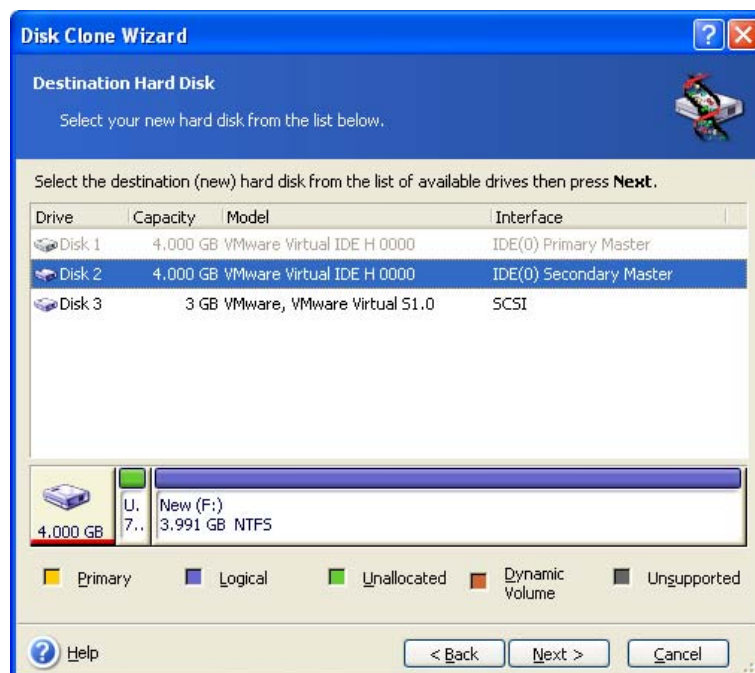
If the program finds several partitioned disks, it will ask you which is the source (i.e. the older data disk).



You can determine the source and destination using the information provided in this window (disk number, capacity, label, partition and file system information).

11.3.3 Selecting destination disk

After you select the source disk, select the destination where the disk information will be copied.



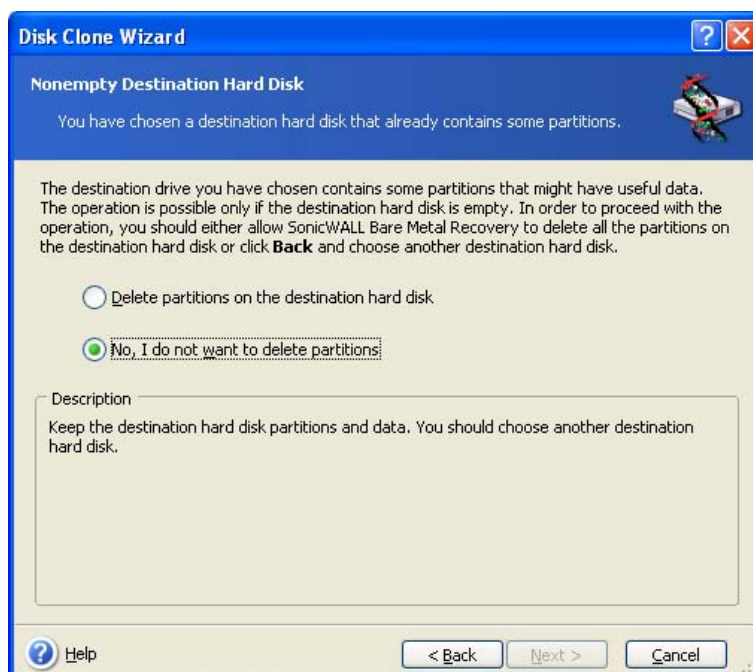
The previously selected source becomes grayed-out and disabled for selection.



If either disk is unpartitioned, the program will automatically recognize it as the destination and bypass this step.

11.3.4 Partitioned destination disk

At this point, the program checks to see if the destination disk is free. If not, you will be prompted by the **Nonempty Destination Hard Disk** window stating that the destination disk contains partitions, perhaps with data.



You will have to select between:

- **Delete partitions on the destination hard disk** – all existing partitions will be deleted during cloning and all their data will be lost.
- **No, I do not want to delete partitions** – no existing partition will be deleted, discontinuing the cloning operation. You will only be able to cancel this operation and return to select another disk.

To continue, select the first choice and click **Next**.



Note that no real changes or data destruction will be performed at this time! For now, the program will just map out cloning. All changes will be implemented only when you click **Proceed**.

11.3.5 Old and new disk partition layout

If you selected the automatic mode before, the program will ask you for nothing further. You will see the window graphically illustrating information (as rectangles) about the source disk (partitions and unallocated space) and the destination disk layout.

Along with the disk number, some additional information is provided: disk capacity, label, partition and file system information. Partition types — primary, logical — and unallocated space are marked with different colors.

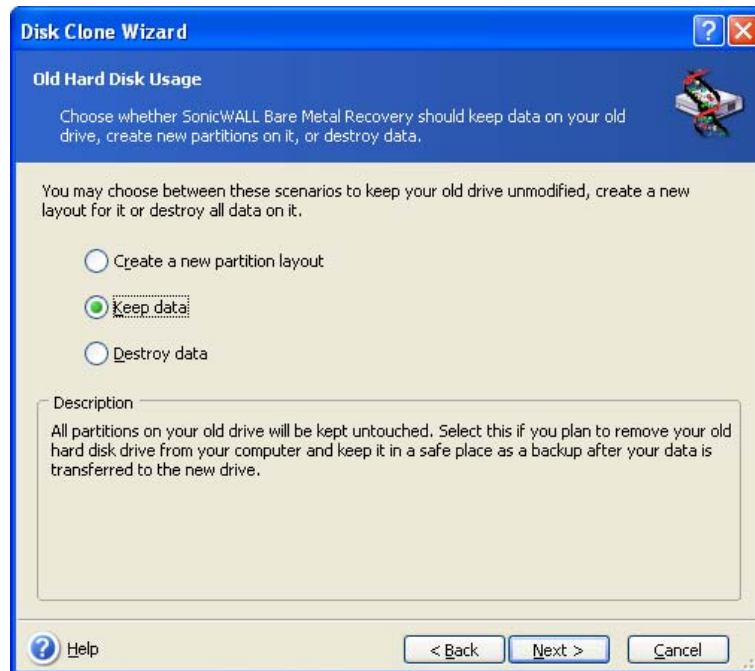
Next you will see the cloning summary.

11.3.6 Old disk data

If you selected the manual mode, the program will ask you what to do with the old disk:

- **Create a new partition layout** – All existing partitions and their data will be deleted (but they will also be cloned to the new disk, so you won't lose them)

- **Keep data** – leave the old disk partitions and data intact
- **Destroy data** – destroy all data on the old disk.



If you are going to sell or give away your old disk, we recommend that you make sure you destroyed the data on it.

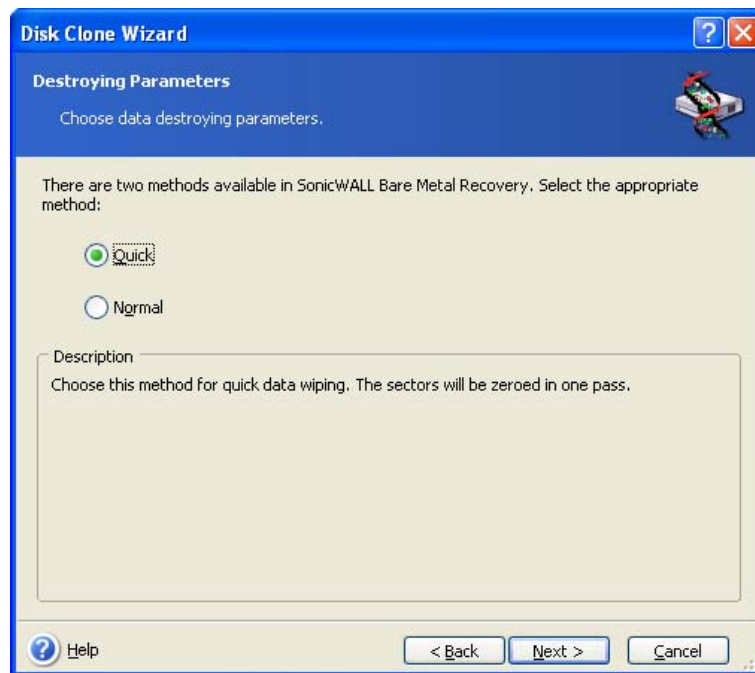
If you are going to keep it for data storage, you can create a new partition layout on it. In this case, the disk will be ready right after cloning is complete.

To protect yourself from unforeseen consequences, it would be better to leave the old disk data intact, as you will be able to delete it later.

11.3.7 Destroying the old disk data

If you elected to destroy the old disk data in the previous step, you will have to select the destruction method now:

- **Quick** – quick one-pass destruction
- **Normal** – multipass destruction



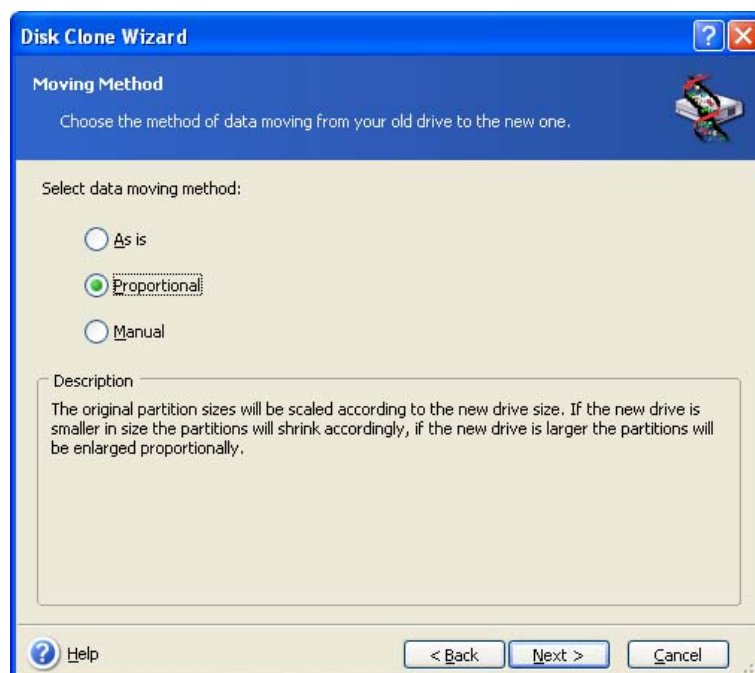
The second method takes more time, but makes it impossible to recover data afterwards, even with special equipment.

The first method is less secure, but is still suitable for most cases.

11.3.8 Selecting partition transfer method

SonicWALL Bare Metal Recovery will offer you the following data transfer methods:

- As is
- **Proportional** – the new disk space will be proportionally distributed among cloned partitions
- **Manual** – you will specify the new size and other parameters yourself



If you elect to transfer information "as is," a new partition will be created for every old one with the same size and type, file system and label. The unused space will become unallocated.

As a rule, "as is" transfers are not recommended, as they leave much unallocated space on the new disk. Using the "as is" method, SonicWALL Bare Metal Recovery transfers unsupported and damaged file systems.

If you transfer data proportionally, each partition will be enlarged, according to the proportion of the old and new disk capacities.

FAT16 partitions are enlarged less than others, as they have a 4GB size limit.

Depending on the selected combination, you will proceed to either the old disk partitioning window, or the disk partition layout window (see below).

11.3.9 Partitioning the old disk

If you selected **Create a new partition layout** earlier in the process, it is now time to repartition your old disk.

During this step, you will see the current disk partition layout. Initially, the disk has unallocated space only. This will change when you create new partitions.

Having completed the required steps, you will add a new partition. To create another one, simply repeat those steps.

If you make a mistake, click **Back** to redo.

After you create the necessary partitions, uncheck the **Create new partition in unallocated space** box and click **Next**.

11.3.10 Old and new disk partition layouts

In the next window, you will see rectangles indicating the source hard disk, including its partitions and unallocated space, as well as the new disk layout.



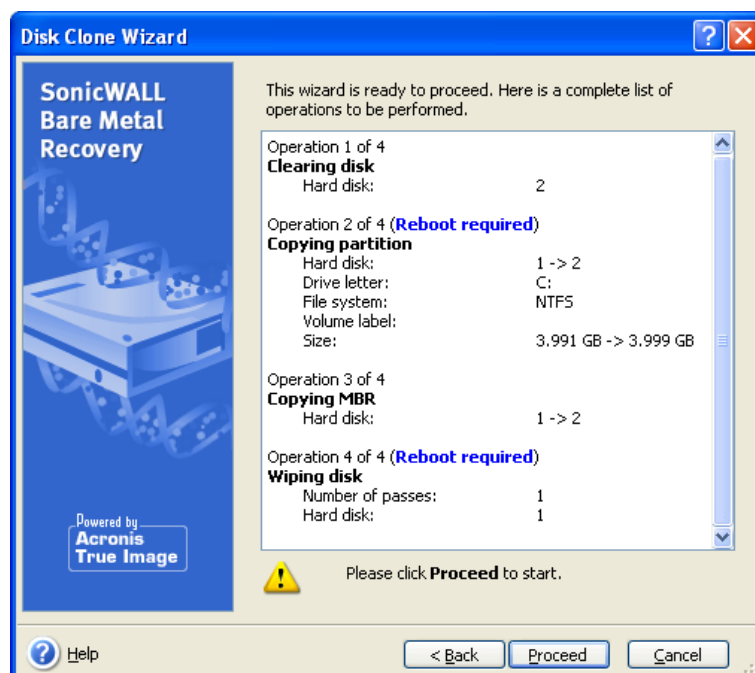
Along with the hard disk number, you will also see disk capacity, label, partition and file system information. Different partition types, including primary, logical and unallocated space are marked with different colors.



If you selected manual partition creation earlier, the partition layout will look different. This partitioning method is described below.

11.3.11 Cloning summary

In the next window, you will see a list of briefly described operations to be performed on the disks.



Cloning a disk containing the currently active operating system will require a reboot. In that case, after clicking **Proceed** you will be asked to confirm the reboot. Canceling the reboot will cancel the entire procedure.

Cloning a non-system disk or a disk containing an operating system, but one that is not currently active, will proceed without reboot. After you click **Proceed**, SonicWALL Bare Metal Recovery will start cloning the old disk to the new disk, indicating the progress in a special window. You can stop this procedure by clicking **Cancel**. In that case, you will have to repartition and format the new disk or repeat the cloning procedure. After the operation is complete, you will see the results message.

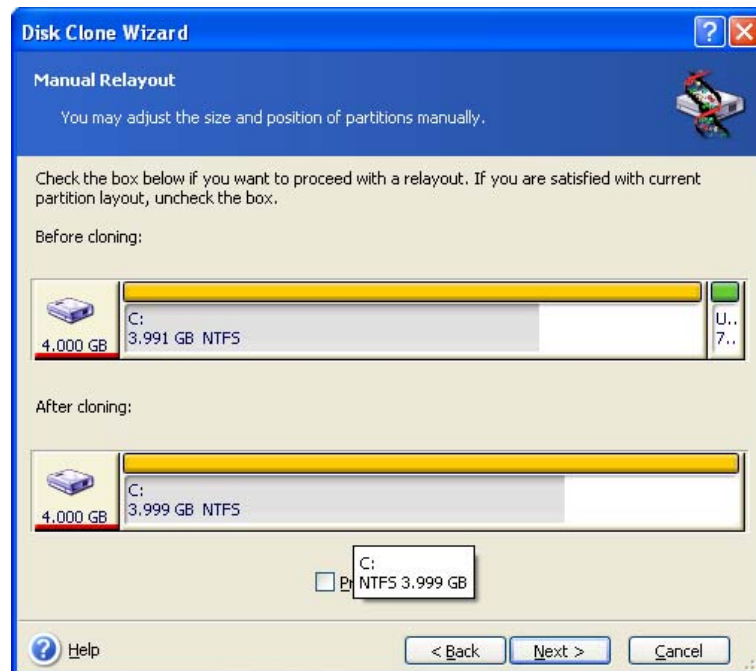
11.4 Cloning with manual partitioning

11.4.1 Old and new disk partition layouts

The manual transfer method enables you to resize partitions on the new disk. By default, the program resizes them proportionally.

In the next window, you will see rectangles indicating the source hard disk, including its partitions and unallocated space, as well as the new disk layout.

Along with the hard disk number, you will see disk capacity, label, partition and file system information. Different partition types, including primary, logical and unallocated space are marked with different colors.



To resize either partition, check the **Proceed relayout** box. If you are satisfied with the partition layout shown, uncheck this box (if checked). Clicking **Next**, you will proceed to the cloning summary window.



Be careful! Clicking **Back** in this window will reset all size and location changes that you've selected, so you will have to specify them again.

First, select a partition to resize. It will be underlined in red.

Resize and relocate it on the next step.

You can do this by entering values to the **Unallocated space before**, **Partition size**, or **Unallocated space after** fields, by dragging the partition borders or by dragging the partition itself.

If the cursor turns to two vertical lines with left and right arrows, it is pointed at the partition border and you can drag it to enlarge or reduce the partition's size. If the cursor turns to four arrows, it is pointed at the partition, so you can move it to the left or right (if there's unallocated space near it).

Having provided the new location and size, click **Next**. You will be taken two steps back to the partition layout. You might have to perform some more resizing and relocation before you get the layout you need.

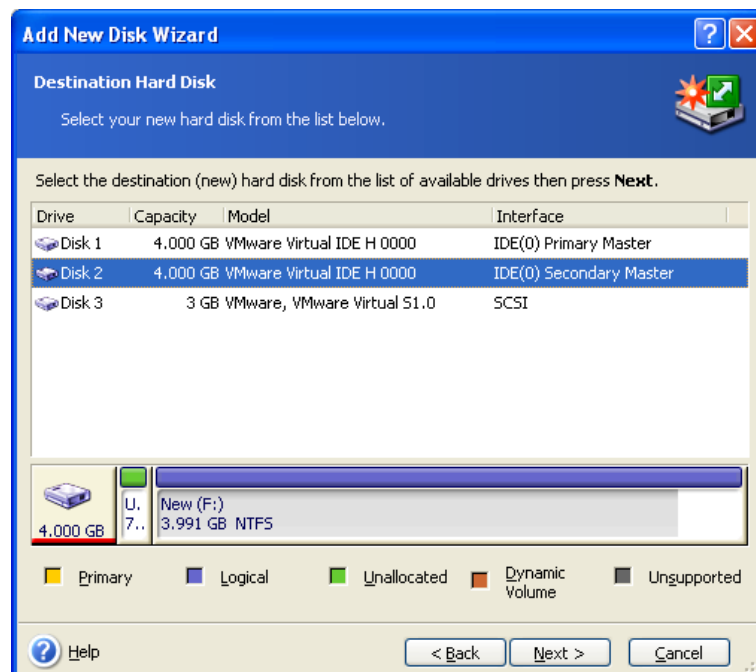
Chapter 12. Adding a new hard disk

If you don't have enough space for your data, you can either replace the old disk with a new, higher-capacity one (data transfers to new disks are described in the previous chapter), or add a new disk to store data, leaving the system on the old disk. If the server has space for another disk, it would be easier to add a data disk drive than to clone a system one.

To add a new disk, you must first install it in your server.

12.1 Selecting a hard disk

Select the disk that you've added to the server.



This window might be bypassed if the program detects the new disk itself. In this case, you will immediately proceed to the new partition creation.

If there are any partitions on the new disk, they must be deleted first.

Select **Delete partitions on the destination hard disk** and click **Next** to continue.

12.2 Creating new partitions

Next you will see the current partition layout. Initially, all disk space will be unallocated. This will change after you add new partitions.

To create a partition, select **Create new partition in unallocated space** and click **Next** to perform steps required by the partition creation wizard.

You will be prompted to set the new partition location and size. You can do this by entering values to the **Unallocated space before**, **Partition size**, or **Unallocated space after** fields, by dragging the partition borders or by dragging the partition itself.

If the cursor turns to two vertical lines with left and right arrows, it is pointed at the partition border and you can drag it to enlarge or reduce the partition size. If the cursor turns to four arrows, it is pointed at the partition, so you can move it to the left or right (if

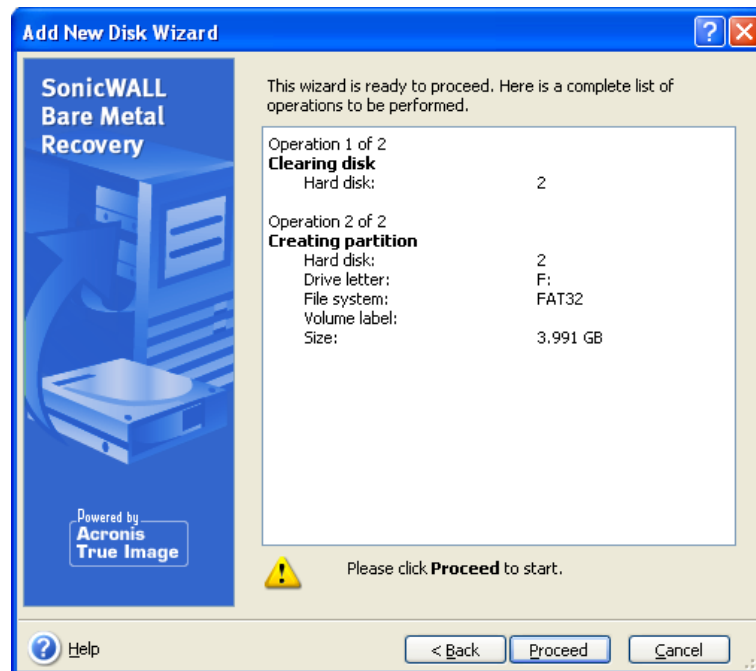
there is unallocated space near it). Having provided the new partition location and size, you can input a label for the new partition.

If you make a mistake at partitioning, click **Back** to redo the process.

Finally, you will be taken back to the partition layout screen. Check the resulting partitions layout and start creating another partition or move on by unchecking **Create new partition in unallocated space** and clicking **Next**.

12.3 Disk add summary

The disk add summary contains a list of operations to be performed on disks.



After you click **Proceed**, SonicWALL Bare Metal Recovery will start creating and formatting new partitions, indicating the progress in a special window. You can stop this procedure by clicking **Cancel**. In that case, you will have to repartition and format the new disk or repeat the disk add procedure.

Chapter 13. Command-line mode

SonicWALL Bare Metal Recovery supports the command-line mode.

The command-line mode functionality is somewhat limited as compared to the GUI mode. You will not be able to perform operations that require the reboot of the system, such as restore a system partition or clone a system drive. These operations only can be done through the GUI.

13.1 Working in the command-line mode

An administrator might need a console interface in some situations. SonicWALL Bare Metal Recovery supports this mode with **TrueImageCmd.exe** utility. The file is located in a folder where SonicWALL Bare Metal Recovery has been installed, by default it is

C:\Program Files\SonicWALL\BareMetalRecovery.

13.1.1 Supported commands

BareMetalRecoveryCmd has the following format:

```
baremetalrecoverycmd /command /option1 /option2...
```

Commands may be accompanied with options. Some options are common for most baremetalrecoverycmd commands, while other are specific for individual commands. Below is a list of supported commands and compatible options.

Command	Common Options	Specific Options
create Creates an image of specified disks and partitions	/filename:[file name] /password:[password] /asz /net_user:[username] /net_password:[password] /ftp_user /ftp_password /incremental /compression:[0...9] /split:[size in MB] /oss_numbers /reboot /log:[file name] /log_net_user:[remote user] /log_net_password:[password]	/harddisk:[disk number] /partition:[partition number] /file_partition:[partition letter] /raw /progress:[on off]
deploy Restores disks and partitions, except for the MBR, from an image	/filename:[file name] /password:[password] /asz /index:N /net_user:[username] /net_password:[password] /ftp_user /ftp_password /oss_numbers /reboot /log:[file name] /log_net_user:[remote user] /log_net_password:[password]	/harddisk:[disk number] /partition:[partition number] /target_harddisk:[disk number] /target_partition:[partition number] /file_partition:[partition letter] /start:[start sector] /fat16_32 /size:[partition size in sectors] /type:[active primary logical] /preserve_mbr When using the SonicWALL Universal Restore option: /ur_path:[path] /ur_username:[user] /ur_password:[pwd] /ur_driver:[inf-filename]
list Lists available drives	/password:[password] /index:N /asz /net_user:[username]	/filename:[file name]

and partitions. With the filename option; lists the image contents	/net_password:[password] /ftp_user /ftp_password	
--	---	--

13.1.2 Common options (options common for most baremetalrecoverycmd commands)

Option	Description	Archive location
Access to archives		
/filename:[file name]	Backup file name	Any
/password:[password]	Specify the password for the archive (if required)	Any
/index:N N = Number of the backup in an archive: 1 = basic full backup 2 = 1st increment... and so on 0 (default) = latest increment	Selects a backup in a sequence of incremental backups inside the archive. To get a backup index from the ASZ, use /asz_content	Any
/net_user:[username]	Specify a user name for network drive access	Network drive
/net_password:[password]	Specify a password for network drive access	Network drive
/ftp_user:[username]	Specify a user name for access to an FTP server	FTP server
/ftp_password:[password]	Specify a password for access to an FTP server	FTP server
Backup options		
/incremental	Set the backup type to incremental. If not specified or there is no basic full backup, a full backup will be created	Any
/compression:[0...9]	Specify the data compression level. It ranges from 0 to 9 and is set to 3 by default	Any
/split:[size in MB]	Split the backup into parts of the specified size	Other than ASZ
General options		
/oss_numbers	Declares that numbers of partitions in the /partition option are adjusted for the MBR partition table rather than just as ascending numbers. This means that primary partitions have numbers 1-1, 1-2, 1-3, 1-4; logical partitions numbers start with 1-5. For example, if the disk has one primary and two logical partitions, their	Any

	numbers can appear as follows: /partition:1-1,1-2,1-3 or /oss_numbers /partition:1-1,1-5,1-6	
/reboot	Reboot the server after the operation is completed	Any
/log:[file name]	Create a log file of the current operation with the specified file name	Any
/log_net_user:[remote user]	If the log file is created on a network share, include the user name for logon to the share	Any
/log_net_password:[password]	If the log file is created on a network share, include the password for logon to the share	Any

13.1.3 Specific options (options specific for individual baremetalrecoverycmd commands)

Option	Description
create	
/harddisk:[disk number]	<p>Specifies the hard disks to include into the image file. The list of available hard disks is provided by the /list command. An image may contain data of more than one hard disk. In that case, separate disk numbers by commas, e.g.:</p> <pre>/harddisk:1,3</pre> <p>By specifying</p> <pre>/harddisk:DYN</pre> <p>you will back up all dynamic volumes present in the system.</p>
/partition:[partition number]	<p>Specifies the partitions to include into the image file. The list of available partitions is provided by /list. Partition numbers are specified as <disk number>-<partition number>, e.g.:</p> <pre>/partition:1-1,1-2,3-1</pre> <p>Dynamic volumes are specified with prefix DYN, e.g.:</p> <pre>/partition:DYN1,DYN2</pre>
/file_partition:[partition letter]	<p>Specifies the partition where the image file will be stored (by letter or number). This option is used with /filename:[file_name]. In that case the file name must be specified without drive letter or root folder. For example:</p> <pre>/file_partition:D /filename:"\1.tib"</pre> <p>Dynamic volumes are specified with prefix DYN, e.g.:</p> <pre>/file_partition:DYN1 /filename:"\1.tib"</pre>
/raw	Use this option to create an image of a disk (partition) with an unrecognized or unsupported file system. This will copy all disk/partition contents sector-by-sector. Without this option only the sectors containing useful system and user data are imaged (for the supported file systems).
/progress:[on off]	Shows/hides the progress information (percent completed). It is shown by default.

Deploy	
<code>/file_partition:[partition letter]</code>	<p>Specifies the partition where the image file is stored (by letter or number). This option is used with <code>/filename:file_name</code>. In this case the file name must be specified without drive letter or root folder. For example:</p> <pre>/file_partition:D /filename:"\1.tib"</pre> <p>Dynamic volumes are specified with prefix DYN, e.g.:</p> <pre>/file_partition:DYN1 /filename:"\1.tib"</pre>
<code>/harddisk:[disk number]</code>	Specifies the basic hard disks to restore.
<code>/partition:[partition number]</code>	<p>Specifies the partitions to restore.</p> <p>Dynamic volumes are specified with prefix DYN, e.g.:</p> <pre>/partition:DYN1</pre>
<code>/target_harddisk:[disk number]</code>	<p>Specifies the hard disk number where the image will be restored.</p> <p>By specifying</p> <pre>/target_harddisk:DYN</pre> <p>you will select unallocated space on all dynamic disks that present in the system.</p>
<code>/target_partition:[partition number]</code>	<p>Specifies the target partition number for restoring a partition over the existing one. If the option is not specified, the program assumes that the target partition number is the same as the partition number specified with the <code>/partition</code> option.</p> <p>Dynamic volumes are specified with prefix DYN, e.g.:</p> <pre>/target_partition:DYN1</pre>
<code>/start:[start sector]</code>	Sets the start sector for restoring a partition to the hard disk unallocated space.
<code>/size:[partition size in sectors]</code>	Sets the new partition size (in sectors).
<code>/type:[active primary logical]</code>	<p>Sets the restored partition active, primary or logical, if possible (for example, there cannot be more than four primary partitions on the disk.) Setting a partition active always sets it primary, while a partition set primary may stay inactive.</p> <p>If the type is not specified, the program tries to keep the target partition type. If the target partition is active, the restored partition is set active. If the target partition is primary, and there are other primary partitions on the disk, one of them will be set active, while the restored partition becomes primary. If no other primary partitions remain on the disk, the restored partition is set active.</p> <p>When restoring a partition on unallocated space, the program extracts the partition type from the image. For the primary partition, the type will be set as follows:</p> <ul style="list-style-type: none"> - if the target disk is the 1st according to BIOS and it has not other primary partitions, the restored partition will be set active - if the target disk is the 1st according to BIOS and there are other primary partitions on it, the restored partition will be set logical - if the target disk is not the 1st, the restored partition will be set logical.
<code>/preserve_mbr</code>	When restoring a partition over an existing one, the target partition is deleted from the disk along with its entry in the target disk MBR.

	Then, with the <code>/preserve_mbr</code> option, the restored partition's entry will occupy the upper empty position in the target disk MBR. Thus, the target disk MBR is preserved. If not specified, the restored partition's entry will occupy the same position as in the source disk MBR saved in the image. If the position is not empty, the existing entry will be moved to another position.
The following options are available when using the SonicWALL Universal Restore. For more information see 3.3 SonicWALL Universal Restore .	
<code>/ur_path:[path]</code> <code>/ur_username:[user]</code> <code>/ur_password:[pwd]</code>	Specifies using SonicWALL Universal Restore and the path to the drivers storage.
<code>/ur_driver:[inf-filename]</code>	Specifies using SonicWALL Universal Restore and the mass-storage driver to be installed.
List	
<code>/filename:[file_name]</code>	<p>With this option, the image contents is displayed.</p> <p>When listing image contents, partition numbers may not coincide with those in the drives/partitions list, if the image does not contain all the disk partitions. For example, if the image contains partitions 2-3 and 2-5, they will be listed as 2-1 and 2-2.</p> <p>If the <code>deploy /partition</code> command cannot find a partition in the image by its physical number, use <code>/partition:<number in the image> /target_partition:<physical number of the target partition></code> keys. For the above example, to restore partition 2-5 to its original place use:</p> <p><code>/partition:2-2 /target partition:2-5.</code></p>

13.1.4 baremetalrecoverycmd.exe usage examples

1. Image disks and partitions

```
baremetalrecoverycmd /create /filename:"C:\Test\1.tib"
/partition:2-1,1-3
```

- This will create an image named 1.tib of the partitions 2-1 and 1-3. The image will be saved to the C:\Test\ folder.

```
baremetalrecoverycmd /create /filename:"\Test\1.tib"
/partition:2-1,1-3 /file_partition:3-1
```

- This will create an image named 1.tib of the partitions 2-1 and 1-3. The image will be saved in the folder \Test on partition 3-1.

```
baremetalrecoverycmd /create /filename:"C:\Test\1.tib"
/password:qwerty /harddisk:2 /reboot /raw /incremental
/compression:5 /split:640 /progress:off
```

- This will append an incremental image to the image named 1.tib of hard disk 2. The image will be saved to C:\Test\ folder, protected with password "qwerty", split into parts of 640MB, and contain all cluster data. Image compression level is 5. The server will be rebooted after the operation is completed.

```
baremetalrecoverycmd /create /partition:2-1
/filename:\\server1\folder\arc.tib /net_user:user1
/net_password:pw1 /log:\\server2\dir\log1.log
/log_net_user:user2 /log_net_password:pw2
```

- This will create an image of partition 2-1 named arc.tib in the shared folder \\server1\folder. The operation log file log1.log will be saved on another share \\server2\dir\ . Credentials for both shares are provided.

```
baremetalrecoverycmd /create /partition:2-1
/filename:ftp://server/folder/archive.tib /ftp_user:usr1
/ftp_password:pswd1
```

- This will create an image of partition 2-1 in the archive.tib file located on the FTP server.

2. Restore disks and partitions

```
baremetalrecoverycmd /deploy /filename:"C:\Test\1.tib"
/partition:2-1
```

- This will restore partition 2-1 from image 1.tib.

```
baremetalrecoverycmd /deploy /filename:"C:\Test\1.tib"
/password:qwerty /harddisk:2
```

- This will restore hard disk 2 from image 1.tib, protected with password 'qwerty'.

```
baremetalrecoverycmd /deploy /filename:"C:\Test\1.tib"
/partition:2-1 /target_partition:1-1
```

- This will restore partition 2-1, stored in image 1.tib, to partition 1-1.

```
baremetalrecoverycmd /deploy /filename:"C:\Test\1.tib"
/partition:2-1 /target_harddisk:3 /start:63 /size:64000
/type:logical
```

- This will restore partition 2-1, stored in image 1.tib, to hard disk 3. A new logical partition will be created on disk 3 from 63 to 64000 sector.

```
baremetalrecoverycmd /deploy /filename:z:\Server30Cdrive.tib
/partition:1-1 /target_partition:2-1 /type:active
/password:123qwe
```

- This will restore partition 1-1, stored in image Server30Cdrive.tib, protected with password '123qwe', to partition 2-1. The restored partition will be of active type.

```
baremetalrecoverycmd /deploy_mbr /harddisk:1
/target_harddisk:2 /filename:ftp://server/folder/arc.tib
/ftp_user:fuser /ftp_password:fpswd
```

- This will restore MBR from the image of hard disk 1 to the hard disk 2. The image is contained in the arc.tib file located on the FTP server.

3. List

```
baremetalrecoverycmd /list
```

- This will list available partitions.

13.1.5 Command-line mode usage under DOS

For use in the MS-DOS-compatible environments SonicWALL Bare Metal Recovery includes the **BareMetalRecoveryCmdDos.exe** utility. It is located in a folder where SonicWALL Bare Metal Recovery has been installed, by default it is C:\Program Files\SonicWALL\BareMetalRecovery.

SonicWALL, Inc.

1143 Borregas Avenue
Sunnyvale CA 94089-1306

T +1 408.745.9600
F +1 408.745.9300

www.sonicwall.com



PN: 232-001627-50 Rev A

©2008 SonicWALL, Inc. is a registered trademark of SonicWALL, Inc. Other product names mentioned herein may be trademarks and/or registered trademarks of their respective companies. Specifications and descriptions subject to change without notice.